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Industrial Report Shows Less Employment

Wisconsin Commission Figures Indicate Production Decline In Future But Employment Is Up From Last Year—Drive For Farm-Cut Pulpwood Is Progressing—Graduate From Mill Trade Course.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., October 4, 1943—Curtailment of production in the face of the dwindling pulpwood supply is seen in the comparative employment reports of the Wisconsin Industrial Commission. During August, the number of workers in paper, pulp and allied mills dropped 0.8% from July, with 23,700 reported on the payrolls as against 23,900. Employment is still up 1.4% from August of 1942, however, when 23,300 were on the payrolls. Converters also reported some decline, with the Milwaukee metropolitan area reporting 2,208 employed in August, 0.3% less than in July.

Payrolls are still up, however, with a weekly average of $870,000 for August, 3.5% higher than the July average of $840,000, and 11.7% above the average of $779,000 in August a year ago. The average earned per worker in August was $36.74 per week for 44.7 hours, making an hourly average of 82.1 cents. The Milwaukee Metropolitan scale was $36.77 for 46.5 hours, or 79 cents per hour for an average weekly payroll of $81,178. This was 1.6% above the same month last year.

Although the campaign for farm-cut pulpwood is meeting with success in Wisconsin and adjacent states, the mills are not expected to reap any great benefits for the immediate months ahead. There will be some relief, but not in volume for the present sufficient to stimulate production a great deal.

More concentrated and coordinated efforts are expected to result from the establishment of a regional pulpwood staff for the Lake States area, attached to the War Production Board's office at Green Bay, Wis. This is in accordance with the order issued by A. B. Hansen, manager of the Northern Paper Mills, Green Bay, who is in Washington trying to remedy the situation in his capacity as deputy director of the WPB pulp and paper division.

Wisconsin's campaign is gaining momentum, and the regional WPB setup is expected to help unify the efforts of the mills, the Wisconsin Conservation Commission, the U. S. Forest Service, county committees, the newspapers and others, and provide a uniform reporting system as well so the progress can be checked.

Promoters of pulpwood cuttnig in the Wisconsin River Valley are planning a "pulpwood roundup" to be held at Tomahawk, Wis., October 23. Demonstrations will be put on to show what increased production means in the output of war goods. Wisconsin's governor, Walter S. Goodland, and other state officials have been invited to attend.

Vern Streeter, a lumberjack of Raco, Mich., is stirring up interest in pulpwood cutting by setting a pace he challenges others to beat. He cuts five cords in a ten-hour day and has set a daily mark of 309 sticks, receiving 7 cents per stick on a piece-work basis. His employer, Ernie Priest, offers to match his crew against any of the pulpwood camps.

Graduate from Kimberly-Clark School

Three more men have been graduated from the junior tradesmen's course conducted by the Kimberly-Clark Corporation, Neenah, Wis. It is conducted by the engineering department of the Lakeview and Badger-Globe mills, and this was the fifth graduation since the program began.

Allan Kane, Joseph Smarzinski and Ray Sanderfoot are the graduates, all of whom completed the maintenance mechanics' course. A banquet was held for them at the Neenah recreation building, with M. E. Palmer, Lakeview mill manager, as toastmaster. Talks were given by Keith Martiny, Lakeview plant engineer and James T. Whalen, chief engineer. Graduation certificates were presented by F. F. Martin of the industrial relations department.

A number of undergraduates are now in military service, and the program has been slowed down because of the shortage of supervisors.

D. Clark Everest, president of the Marathon Paper Mills Company, Rothschild, Wis., is serving on a committee of leading Wisconsin business and professional men to raise a fund of $250,000 for Northland College, Ashland, Wis. The drive thus far has reached the $100,000-mark.

Mrs. Joseph H. Miller is Dead

Mrs. Joseph H. Miller, wife of the vice-president and general manager of the Whiting-Plover Paper Company, Stevens Point, Wis., died Monday evening, September 27, at St. Mary's Hospital, Rochester, Minn., after a short illness.

No Agreement on Wages Reached at Meeting

Five-Day Canadian Conference Between Management and Unions Fails To Adopt Proposed Joint Application To Equalize All Wages In Pulp and Paper Industry — Ask For Pulpwood Ceiling Bonus.

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., October 4, 1943—At the conclusion here of a five-day conference of representatives of the pulp and paper industry and several unions it was announced that the unions and management had failed to agree on a proposal for a joint application to the War Labor Board for equalization of all wages in the pulp and paper industry and that the unions are now filing their own application without the support of the employers. It was also announced that women may become very essential partners of pulp and paper makers in Canada if the present problem of manpower shortage hontinues.

Head of Pulp Workers Union States Case

John P. Burke, president of the International Brotherhood of Pulp, Sulphite and Papermill Workers, in an interview following the conference said, "The international unions propose the establishment of an average rate of 56 cents an hour plus the cost-of-living bonus in all provinces, the same rate which at the present time is paid in most of Ontario paper mills." He emphasized that the unions submitted the proposals to the employers after considerable dissatisfaction among the paper-workers of Quebec, New Brunswick, Nova Scotia, and of a few Ontario mills became apparent during recent conventions and meetings of the various international unions. The present base rate of the provinces mentioned is 45 cents an hour plus cost-of-living bonus. He said, "The difference of 11 cents an hour can not be brushed aside by any kind of cost-of-living index. It is there, and the men know it."

He admitted that on higher rated jobs in the industry the difference between "Ontario wages and others in the Dominion, although in the same industry, is not quite as great."

Mr. Burke said that practically every problem connected with the industry was discussed at the conference, and there was a joint demand by the two groups that the government should class newsprint manufacture as an "essential" industry.

Statement of Head of Paper Workers Union

Arthur Huggins, president of the International Brotherhood of Papermakers, who also gave out a statement said, "One of the dangers at present facing the whole industry, employers and employees alike, is the shortage of pulp wood. If this shortage continues very much longer, production may have to be curtailed, unless the government finds way and means to increase next year's supply to the mills."

Mr. Huggins during his final address at the conference appealed to the public, the government and the workers to cooperate in carrying out a general program which aims to maintain the present high standard of production and at the same time gives Canada a good start for a post-war reconstruction program. Asked about Canada's future possibilities on the world paper market, Mr. Huggins confidently predicted "Canada can, and I believe will, be among the first and few countries ready to serve whatever the needs will be, provided government, industrial management and the Canadian workers can agree on and provide now the tools and machinery as well as all other means to attain a position of leadership among world competitors in the industry."

He said that women, naturally are not expected to work in the woods or to handle pulpwood, but maintained that a number of operations in the mills could be temporarily executed by "strong and healthy women" until such a time when a readjustment of manpower, now under way, will bring relief to a great number of mills. It was also learned that many men now enrolled in the armed forces, but not fit for overseas services or not voluntarily enlisted for duties outside of Canada, may be released very shortly to return to work.

Sixty Attend Wage Conference

Over 60 representatives of the industry and the international unions attended the conference. Among them were the following:

S. L. deCarteret, Canadian International Paper Company; G. J. Adams, Canadian International Paper Company; T. H. Robinson, Canadian International Paper Company; F. Tomkins, Canadian International Paper Company, Hawkesbury, Ont.; P. J. Murer, Canadian International Paper Company, Temiskaming, Que.; H. Copeland, Canadian International Paper Company; G. F. Layne, Price Brothers; Geo. McNaughton, Price Brothers, Kenogam; B. J. Waters, Mersey Paper Company, Ltd.; Edw. Flynn, Price Brothers & Company; G. F. Layne, Price Brothers & Company; H. D. Boyle, Price Brothers & Company; Geo. McNaughton, Price Brothers & Company; J. R. Latter, Anglo Canadian Pulp and Paper Mills; J. D. B. Howard, Bathurst Power and Paper Company; R. L. Weldon, Bathurst Power and Paper Company; J. G. Chalmers, Bathurst Power and Paper Company; G. J. Lane, Quebec North Shore Paper Company; R. J. Askin, Ste. Anne Paper Company; P. M. Fox, Lake St. John, Pulp and Paper Company, Ltd.; A. Geo. Jacques, St. Lawrence Paper Mills Co., Ltd.; W. Kidd, E. B. Eddy Company; F. D. Ayman, J. R. Booth, Ltd.; F. S. MacDonald, J. R. Booth, Ltd.; J. P. Rolland, Rolland Paper, St. Jerome; F. Labelle, Rolland Paper; Leo Dickson, Rolland Paper Company, Ltd., Mount Rolland; J. B. West Canadian International Paper Company; Aubrey Crabtree, Fraser Companies, Ltd.; D. A. McAlary, Restigouche Company, Ltd.; A. E. H. Fair, Howard Smith Paper Mills, Cornwall; E. Little, Anglo Canadian Pulp and Paper Mills.

Want Ceiling Bonus on Pulpwood

New Brunswick pulpwood dealers and producers, at a meeting with representatives of the Timber Control Department, have urged removal of pulpwood ceiling prices in the case of New Brunswick mills or, failing this, a bonus of $3 per cord.

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Company.....

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City.....State.....

Chicago Reports Paper Demand at New Peak

Heavy Buying In All Lines Is Stimulated By News of Shortages—Backlog Orders In Some Major Lines Are Large—Paper Men Hold Outing—New Ruling On Out-State Shipments Tax—Other News.

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., October 4, 1943—The sessions of the pulp and paper industry centering around the TAPPI War Time Conference, served to crystallize the immediate problems confronting the industry, according to local paper trade executives who were in attendance. The effect of certain price regulations on pulp and paper production and the increasingly serious manpower situation continue to be topics of major importance here as are the October pulp requirements.

Demand, in all lines, has reached an unprecedented point as buyers, acutely aware of shortages and daily advised by the press of the situation, are reaching to make all accumulations possible. Sulphite markets, locally, were reported many months back in their order backlog while krafts and groundwoods were in a similar position. Recent standardization programs and reductions in weights seem to have had little effect on the desire of industry for paper for general business use. Bonds and ledgers are likewise in heavy demand while the box board industry is facing a critical holiday season and filling only standard orders in allocated quantities, according to local observers. The waste paper market expects to benefit by new salvage drives just beginning to get under way in this part of the country.

Refund Due Out-of-State Shippers

The recent ruling of the Illinois Department of Revenue which threw Chicago paper jobbers into a dither because of its obvious intent to apply the 2% Occupation Tax on all sales in Illinois regardless of where the sale originated or from where the merchandise was shipped, has been abrogated by a recent court decision from the State Supreme Court.

As a result of the decision based on protests from several firms over the attempt of the state to collect the tax on such sales, the Revenue Department this week officially announced that the tax need not be paid by retailers on sales prior to July 1, 1943, in which all the elements of the selling activity, except the solicitation of orders, occurred outside Illinois.

The paper industry and other groups were warned, however, that because of an amendment to the Illinois law at the recent session of the Assembly, sales after July 1, 1943, are not affected because "the new amendment states that solicitation or orders in Illinois constitutes engaging in retail selling business within the meaning of the Act." Vendors who have withheld payment of the tax up to the above date and those who have paid prior to that date may now file claims for credit from the Department. However, even here, legislative statue provides that such claims are in credit.

Association Outing Most Successful

S. S. Weil, of Joseph Weil & Sons, president of the Chicago Paper Association, reports that the September 23 golf outing at the Tam O Shanter Golf Club was "the most successful event we have ever staged, a method of disseminating good will and fellowship which obviously made a big hit with the 350 members and guests who were present."

Many of the nation's well known paper industry leaders were present at the afternoon and evening affair which was held in conjunction with the TAPPI and industry wide meetings in Chicago during the week and a large number of the guests were among those who successfully competed for the 127 prizes which were offered.

The dinner meeting was featured by a short talk given by Raymond Bee of the International Paper Company, who briefly outlined paper conditions today and stressed the importance of unanimity and coordination of action all along the line. Other speakers were William Leathers, formerly of OPA and now assistant seccetary of the National Paper Trade Association, and Joseph Weil, father of the Chicago Paper Association's president, who made a grand talk on the fellowship within the industry. Speakers table guests who responded briefly to introductions included President Burkin of the Paper and Twine Club; Bob Zeigler and Arthur Chamberlain of the N.P.T.A. staff; Corwine E. Roach, president of the Association (and looking hale and hearty again) and John Richey, secretary of the Paper and Twine Club.

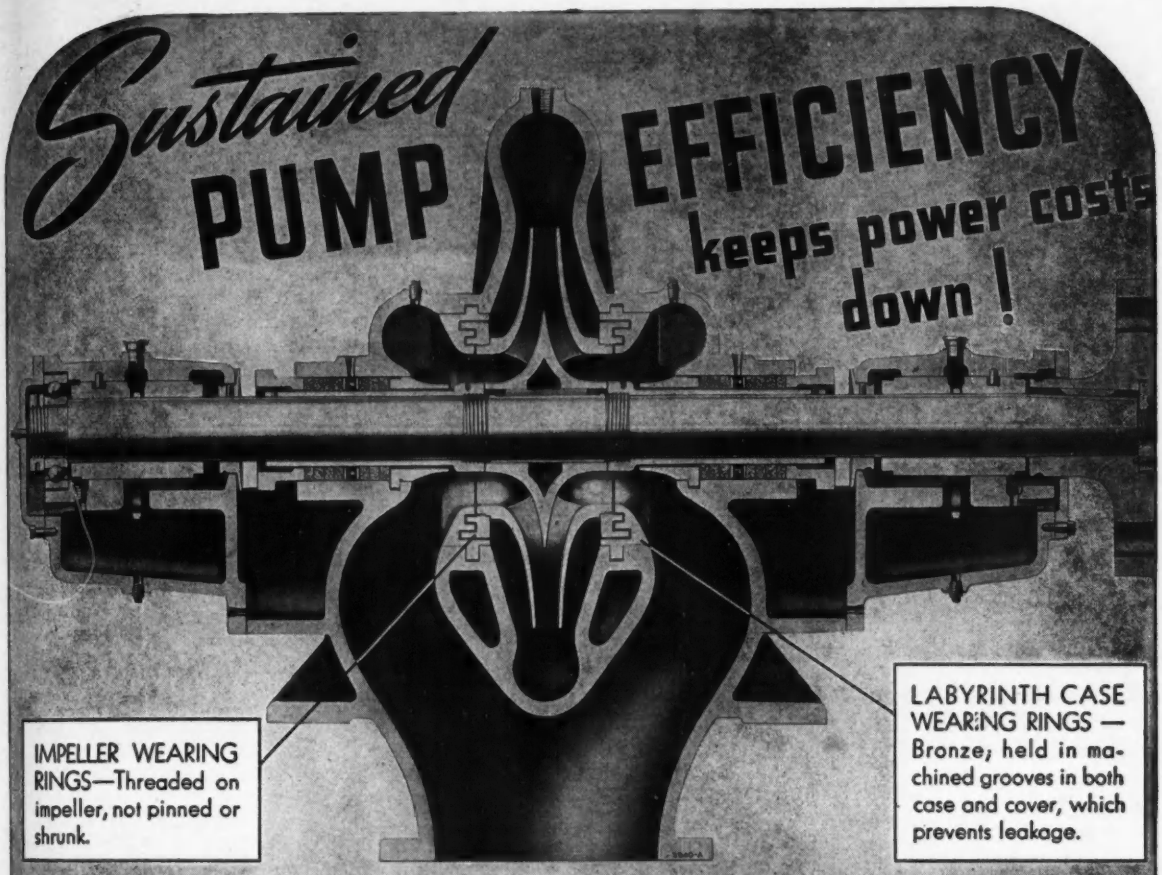
Suggest Analysis of Paper Usage

There is a great deal of conversation in the Chicago area over the very grave shortage in pulp and paper as compared with the tremendous quantities of paper now being used not only for government bulletins covering perplexing—and some say useless— rulings, but by certain elements within the trade itself. Certain paper trade executives have collected hundreds of bulletins on a wide variety of subjects which they feel have little or no relation to the war effort. Others have called attention to such things as a 24-page bulletin on "The Grocers War-time Procedure" which the Department of Commerce is reported to be sending to thousands of hard pressed grocers to tell them how to react to an unfavorable and disgruntled public opinion. Other bulletins on health, hygiene, defense work for civilians, bureau publicity and other material are all considered as consuming reams of vitally important paper without doing "a great deal of good" as one commentator put it. Certain elements within the trade are reported to believe that the organized paper industry would do well to throw the spotlight on many of these publications as a means of "protecting its own customers and its actual existence."

Paper Employment Rises

The 279 reporting firms in the industry group on which statistics are developed by the Illinois Department of Labor show a 7.4% increase in employment on July 15 as compared to June 15 and a 2.6% increase in payrolls. Average weekly earnings in the paper goods, printing and publishing industries were $37.51.

Sustained PUMP EFFICIENCY keeps power costs down!


IMPELLER WEARING RINGS—Threaded on impeller, not pinned or shrunk.
LABYRINTH CASE WEARING RINGS — Bronze, held in machined grooves in both case and cover, which prevents leakage.

Initial high pump efficiency is sometimes obtained by the use of excessively close clearances between wearing rings, but, attained in this way, it is not long maintained, particularly where flat rings are relied upon.

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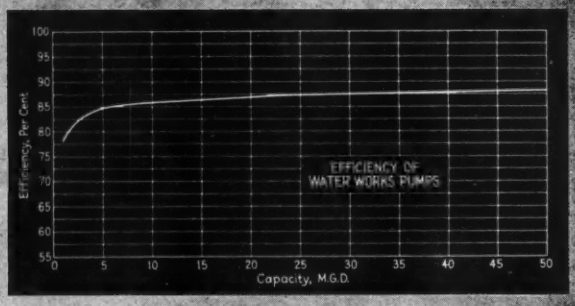
Unit No. 4 in the acceptance test on January 22, 1927, showed a wire-to-water efficiency of 82.7 per cent and, when tested again on January 20, 1933, an efficiency of 83.9 per cent.



Efficiencies attainable with various capacities at heads between 125 and 225 ft.

Similarly, Unit No. 5 on the acceptance test on March 3, 1927 showed 83.3 per cent efficiency and, when tested again on January 31, 1933, it showed 83.9 per cent.

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For further particulars and other instances, ask for Publication P-3225.

DE LAVAL STEAM TURBINE CO. . . TRENTON, N. J.

FINANCIAL NEWS

New York Stock Exchange

High, Low and Last for Week Ending October 2, 1943

STOCKS

	High	Low	Last
A. P. W.	2½	1⅞	2½
Armstrong Cork Co.	39¼	37½	37½
Celotex Corp.	13¼	12⅞	13
Celotex Corp., pf.	18¼	18	18¼
Certain-Teed Products Corp.	6⅞	6¼	6¾
Certain-Teed Products Corp., pf.	71	61¾	69½
Champion Paper & Fibre Co.	20¼	20	20
Champion Paper & Fibre Co., pf.	107½	107	107
Congoleum Nairn Co.	23⅝	23	23⅝
Container Corp. of America	21⅞	21¼	21¾
Continental-Diamond Fibre Co.	12¾	12½	12⅝
Crown Zellerbach Co.	16⅛	15⅞	16⅛
Crown Zellerbach Co., pf.	99	97¾	98⅜
Dixie Cup Co.	....	....	....
Dixie Cup Co.—A	44	43¼	43¾
Flintkote Co.	21	20¼	20⅞
Flintkote Co., pf.	....	....	....
Robert Gair	3¼	2⅞	3¼
Robert Gair, pf.	14⅞	12¾	14½
International Paper Co.	13⅜	12⅝	13
International Paper Co., pf.	67½	66	67½
Johns-Manville Corp.	92½	90½	91¾
Johns-Manville Corp., pf.	130½	130	130½
Kimberly-Clark Corp.	31¼	31¼	31¼
MacAndrews & Forbes	26½	26	26
MacAndrews & Forbes, pf.	....	....	....
Masonite Corp.	39½	38½	39½
Mead Corp.	8⅝	8⅜	8⅜
Mead Corp., pf. A—6%	88	88	88
Mead Corp., pf., B—5½%	78½	78	78
National Container Corp.	13	12¾	12¾
Paraffine Companies, Inc.	44¾	44¼	44¾
Paraffine Companies, Inc., pf.	101¼	101¼	101¼
Rayonier, Inc.	14⅜	13½	13⅞
Rayonier, Inc., pf.	31½	31	31
Ruberoid Co.	28	27½	28
Scott Paper Co.	41	40	40
Scott Paper Co., pf.	112	112	112
Sutherland Paper Co.	28¾	28¾	28¾
Union Bag & Paper Corp.	10¾	9¾	10⅛
United Paperboard Co.	4½	4½	4½
U. S. Gypsum Co.	74½	73½	73½
U. S. Gypsum Co., pf.	174	173½	174
West Virginia Pulp & Paper Co.	15⅜	14¾	15
West Virginia Pulp & Paper Co., pf.	....	....	....

BONDS

Abitibi Pulp & Paper Co. 5s '53	68	68	68
Celotex Corp. 3¾ '55	102⅛	101¼	102⅛
Certain-Teed Products Corp. 5½s '48	101¼	100⅞	101
Champion Paper & Fibre Co. 4¾s '50	....	....	....
International Paper Co. 6s '55	107½	106	106
International Paper Co. 5s '47	104	104	104
Mead Corp. 3½s '53	....	....	....
West Virginia Pulp & Paper Co. 3s '54	....	....	....

New York Curb Exchange

High, Low and Last for Week Ending October 2, 1943

STOCKS

	High	Low	Last
American Box Board Co.	8	8	8
Brown Co., pf.	....	....	....
Great Northern Paper Co.	33¼	32½	32½
Hummel-Ross Fibre Corp.	4½	4½	4½
St. Regis Paper Co.	3⅜	3⅜	3¾
St. Regis Paper Co., pf.	135	134	135
Taggart Corp.	4½	3⅞	4¼

BONDS

American Writing Paper Co. 6s '61	98	98	98

Champion Nets 91 Cents

The Champion Paper and Fibre Company for the sixteen weeks to August 15, reports a net profit of $664,334, or 91 cents a common share, against $672,763, or 92 cents a share, for corresponding weeks last year.

Dennison Co. Need Not Refund

The Dennison Manufacturing Company for 1942 states that it has been determined that no refund to the Government is required for the year 1942 under the renegotiation provisions pertaining to war contracts.

Abitibi Reorganization Progressing

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., October 4, 1943 — Ontario's new premier, Col. Geo. A. Drew, has lost little time in taking steps to facilitate Abitibi Power and Paper Company getting out of receivership and back under private management. On Monday of last week it was announced that the Government had approved the appointment of a committee to study means of taking the company out of receivership, but the announcement was withheld for a few days until members of the committee could be consulted and their approval obtained.

The committee is headed by Hon. Frank J. Hughes, K. C., prominent Toronto lawyer and formerly Crown Attorney for the City. The other two members are William Zimmerman, also a lawyer of Toronto, and Dr. Gilbert E. Jackson, who for many years has been prominent in Canadian economic life, both from the academic side at the University of Toronto and McGill University, Montreal, and from a business standpoint as economist of the Bank of Nova Scotia and adviser to the governors of the Bank of England.

Several plans, it is understood, will be submitted to bondholders and shareholders in the near future. Many plans have been proposed since the decision of the Privy Council validating the Abitibi Moratorium Act, which prevented bondholders from enforcing their security by foreclosure.

A. P. W. Co. Nets 15 Cents

The A. P. W. Paper Company, for the year to June 30, reports net income, after $55,000 reserve for contingencies, was $23,736, or 15 cents a common share, compared with $206,974, or $1.29 a share of common stock in preceding year after $100.000 contingency reserve. Net sales totaled $4,522,146 against $5,514,738, the approximate 18% reduction being occasioned by company's inability to maintain former high production schedules because of manpower problem in area in which it operates, Dwight G. W. Hollister, president, explained.

H. S. P. Co. Nets $1.64

The Harris-Seybold-Potter Company for the year to June 30, reports a net income of $306.669, equal to $1.64 a common share, against $416,940, or $2.48 a common share, for preceding fiscal year; net sales, $8,021,988, compared with $6,809,820.

Nekoosa-Edwards Votes Dividend

A dividend of 50 cents per share has been declared by the Nekoosa-Edwards Paper Company, Port Edwards, according to announcement of John E. Alexander, president.

It is payable to all stockholders of record as of September 20.

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SOCONY-VACUUM

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R. L. Stern Gets Citation of Merit

The Ordnance Department, U. S. Army, has presented a citation of merit to Raphael L. Stern, chemical superintendent of the Parlin, N. J., plant of Hercules Powder Company, whose adaptation of wood pulp for the manufacture of smokeless powder has increased the output of explosives and eliminated the threat of a cotton "bottleneck."

The award, which cites Mr. Stern for "distinguished service to his country in the struggle to maintain the freedom of all people," was presented on behalf of Major General L. H. Campbell, Jr., chief of ordnance, by Col. Gilbert I. Ross, chief of the New York Ordnance District. L. N. Bent, vice president, and E. G. Crum, plant manager, of the Parlin plant of the Hercules Powder Co., and officers of the New York Ordnance District, witnessed the presentation.

By using wood pulp to supplement inadequate supplies of cotton linters, the raw material for smokeless powder, American, Canadian and Australian explosives plants have increased powder output by one quarter, while reducing cost of production by about $20,000,000 in American ordnance plants this year.

Before Mr. Stern attacked the problem of adapting wood pulp for its production, smokeless powder was manufactured solely from cotton linters. However, the heavy increase in war-time demands for smokeless powder in the face of insufficient supplies of cotton linters to meet these demands, made it necessary to find a substitute to supplement the use of cotton.

The Hercules process of adapting wood pulp as developed by Mr. Stern not only increased output but reduced powder consumption, power plant installations, amount of equipment necessary, and cost of the finished product.

The Hercules Company made available the wood pulp development without cost to the governments of the United Nations and to all American producers as soon as it had been found effective.

Several large timber companies cooperated in the experimental work by supplying wood pulp in the form and according to the specifications required for smokeless powder. The pulp and paper companies developed a standard grade of wood pulp in a special size suitable for the experimental work. Through this cooperation, the wood pulp requirements of the United Nations' explosive industries are now such that they can be met easily by wood pulp producers in all of the United Nations.

"By the exercise of his initiative and ingenuity," the citation reads, "he has made a marked contribution to the vital war production program to conserve critical material and machines."

H. C. Kinne May Engage in Business

WATERTOWN, N. Y., October 4, 1943—Announcement is made here that Harry C. Kinne, for many years prominent in the paper mill industry of Northern New York, will be released from his present position as area rent control director some time this month. Mr. Kinne, who was sales representative of the Black-Clawson Company, of Hamilton, Ohio, before assuming his present directorship, is said to be negotiating for a private business. For about forty years he was associated with the Bagley & Sewall Company but retired from his position as vice president and sales manager in 1939.

W. G. Leathers Joins National Staff

Williard G. Leathers has been appointed to the position on the staff of the National Paper Trade Association made vacant by the resignation of Bob Ziegler.

Bill Leathers is a graduate of Exeter Academy and Yale University. After obtaining his A.B. degree, he took some special engineering courses at the Massachusetts Institute of Technology.

Later Mr. Leathers taught a course in industrial management at the Northeastern School of Business, Worcester, Mass.

His first business connection was with the Hood Rubber Company for three years, applying his engineering training in various branches of operation, becoming production foreman and then taking a supervisory position in the production department. For seven years thereafter, he was with the Dennison Manufacturing Company, an institution well known in the paper industry, occupied successively with methods of engineering and product development, merchandising and sales promotion.

In 1941 he entered the Office of Price Administration as chief of the Converted Paper Products Unit, subsequently becoming chief of the entire Paper Products Section including coarse papers, converted paper products, paperboard, boxes, etc., and having to do with price regulations for both manufacturers and distributors. In this capacity he gained a wide acquaintance in the manufacturing and distributing field and acquired much detailed knowledge of their operations and problems. He leaves the Price Office with most cordial expressions of appreciation for his able efforts. His two years' Washington experience and familiarity with the personnel, policies and methods of Governmental agencies will be of great value in carrying on his new work.

Appoints Newsprint Committee

Six representative newsprint manufacturers of the United States were appointed members of a Newsprint Industry Advisory Committee by the Office of Price Administration on September 29.

The members, who represent over 80% of U. S. newsprint capacity and are from the major producing areas of the country, will hold their first meeting October 5 in New York City for the purpose of selecting a chairman and dealing with other organizational matters.

This committee has been appointed to consult with OPA on industry matters that should be taken into consideration in connection with newsprint price control. Revised Maximum Price Regulation No. 130 (Newsprint Paper) provides ceilings for U. S. newsprint manufacturers.

Appointment of this committee is in line with OPA's policy of having industry advisory committees for all industries subject to price control.

The committee follows: J. D. Zellerbach, President, Crown-Zellerbach Co., San Francisco, Cal.; E. L. Kurth, President, Southland Paper Mills, Lufkin, Tex.; Jahn L. Hobson, Treasurer, St. Croix Paper Company, Boston, Mass.; Samuel Pruyn, Sales Manager, Finch, Pruyn Co., Glens Falls, N. Y.; Harold Smith, President, Maine Seaboard Paper Company, New York, and C. B. Stanwood, assistant Manager of manufacturing, Great Northern Paper Company, Boston, Mass.

These times call for *action!* When you build corrosion-resistant equipment, get it into service *fast* with Penchlor* Acid-Proof Cement.

Penchlor Cement is a sodium silicate type cement—quick-setting and self-hardening. No long waits for drying. No acid treatment necessary to harden . . . Penchlor Cement is easy to handle—simplifies construction, speeds repair, saves labor. This cement has *proved* its durability by years of excellent performance in the toughest kind of acid-resistant service.

• Where conditions require a cement of unusual strength and high resistance to abrasion, consider the other Pennsalt Corrosion-Resistant Cements: *Asplit**, for conditions always acid . . . *Causplit**, for alternate acid and alkaline conditions. These are easy to handle and will withstand a wide range of corrosive conditions up to 350 degrees F.

• At your service, without obligation, is the long experience of our engineers in handling acids and alkalis in our own plants. Write fully or if you prefer, use the coupon.

*Trade-mark Reg. U.S. Pat. Off.

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I would like to have a free copy of your new booklet No. 6 on Penchlor Acid-Proof Cement.

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TITLE_____

COMPANY_____

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George M. Wetmore Resigns

George M. Wetmore, for 23 years sales manager of the Claremont Paper Company has resigned from that organization.

Well known in paper circles in New York, New England and the Middle West, his broad career embraces a beginning in Cincinnati in the merchants' end of the industry with Diem & Wing Paper Company and later with Edward F. Herlinger.

After coming East to York, Pa., as sales manager of the Schmidt and Ault Paper Company, he left

GEORGE M. WETMORE

there in 1920 to associate himself with the combined sales organization of Claremont Paper Company, Inc., and the Groveton Paper Company, Inc., in New York.

When the Brompton interests in Groveton were sold he remained with Claremont until his recent resignation.

His future plans are not definite, but embrace a desire to capitalize on this experience of over 20 years in selling high grade kraft and special converter paper.

The Claremont Paper Company, Inc., announces the appointment of Willard T. Libby to the office of sales manager. Mr. Libby has been in the company's sales department for the past 13 years and is well known throughout the industry. He succeeds George M. Wetmore as sales manager.

Mr. Libby will be assisted by Harold B. Brinig who has been associated with him on the company's sales force for several years.

Paper Men Aid War Fund Campaign

The $17,000,000 Fall campaign of the New York Committee of the National War Fund has enlisted a number of leaders of the paper industry to help make it a success, James A. Farley, chairman of the Commerce and Industry Division has announced.

Hugh J. Chisholm has accepted appointment as chairman of the paper industry group. Serving with Mr. Chisholm are George B. Gibson, vice-chairman, and Lionel M. Goldberg, secretary.

Chairman of the different sections of this group are Rufus Worrell, book and coated paper; Stanley H. Andrews, envelopes; Henry Savage, fine paper and specialties; J. D. Johnston, kratt paper; R. F. Kellogg, newsprint; Fred Low, paper merchants; Fred Enders, pulp agents; and James Levens, wholesale paper merchants.

Paul White will head the old paper and rags section assisted by the following committeemen: Sol Ash, Joseph Benedetto, Robert Blank, James Carrano, Robert Carraway, Walter Clark, James Derrico, Joseph Gaccione, Lawrence Giove, Harris Goldman, Louis Gottlieb, William Green, Charles M. Haskins, A. T. Hicks, Morris Kay, E. J. Keller, Julius Levine, David Levy, Louis Markowitz, Walter Martens, Abe Mitchell, John L. Nielsen, Carlton Overton, Harry Pearlman, William Roach, Arthur Rosenfeld, Julius Villano, Abe Waldman, and Ralph Williams.

Samuel Kipnis has been appointed chairman of the paper boxes section. This section has been divided into the following sub-committees: David Rouss, corrugated boxes; W. L. Stevens, fibre cans and tubes; George E. Dyke, folding boxes; William Conescu, setup boxes (Brooklyn and Manhattan); G. J. Dubey set-up boxes (Brooklyn and Long Island City); and Jacob E. Schorsch, paper boxes (Bronx).

In announcing these appointments, Mr. Farley said the Commerce and Industry Division will be responsible for raising upwards of 50% of the five-borough goal of $17,000,000 in this Fall's campaign for the support of the USO, the United Seamen's Service and fifteen other major war-related organizations serving our own armed forces and the civilian relief needs of the United Nations.

Mills Form Joint Sales Co.

The J. P. Lewis Company, Beaver Falls, N. Y., and the Brownville Board Company, Brownville, N. Y., have announced that beginning October 1, 1943, sales of the two concerns will be handled by a new company, the Lewis-Brownville Sales, Inc., with a central office at 270 Broadway, New York.

The sales organization is wholly owned by the mills and will devote considerable effort to its merchant agency line of products. As the mills of the two manufacturers are located near each other, the joint sales arrangement will facilitate shipments in pool cars and make it possible to render better service to customers.

Although the sales efforts of the two concerns will be merged, mill management will remain as formerly.

The officers of Lewis-Brownville Sales, Inc., are as follows: Albert H. Miller, president. Directors—Harry S. Lewis, president, J. P. Lewis Co., and W. S. Gamble, vice-president, Brownville Board Company.

Sales representatives are as follows: Metropolitan New York, Pennsylvania and the South, Erwin Brown; New England, Charles S. Brown; Northern New York and Eastern Ohio, Lawson Ramage.

Cost of Fighting Fires Drops

Cost of fighting forest fires in British Columbia until the end of August has been the lowest since 1925 according to the Hon. Wells Gray, British Columbia Minister of Lands.

To date there have been 791 outbreaks against 926 last year and 1377 in the same period of 1941. By districts the figures are: Vancouver, 226 compared with 200 at this tme last year; Prince Rupert, 28 against 39; Fort George, 87 against 158 last year; Kamloops, 220 compared with 328, and Nelson, 230 against 201 in the corresponding period of 1941.

How to connect GLASS PIPING to your present equipment

It is easy to connect glass piping to any pipe line, valve, pump or tank in your plant. If you have hesitated about installing a trial piece of glass piping or a short line because of the possible difficulty of making a tight joint with your present equipment, here is the answer to your problem.

Use the proper adaptor flanges, drawings of which are shown herewith. You can now purchase these standard stock adaptor flanges to connect Pyrex piping directly to:

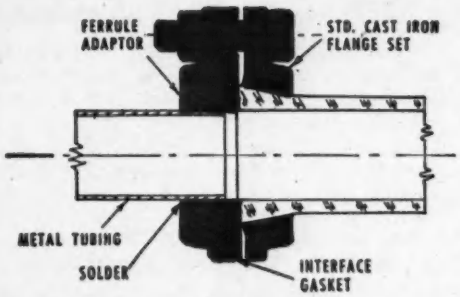
STEEL	PORCELAIN
CAST IRON	GLASS-LINED PIPE
LEAD	HARD RUBBER
STAINLESS	RUBBER-LINED METAL

With these adaptor fittings it is a simple matter to discover to your own satisfaction just where you can profitably use PYREX piping—places where you can take advantage of its remarkable resistance to all acids and alkalies (except HF), resistance to abrasive action of slurries and gritty particles, and its ability to withstand thermal shock. Its crystal-clear transparency and its long life and reasonable cost may mean that it is the best piping for that line which has been giving you trouble. Here at Corning our research facilities have helped to find the answers to many troublesome piping problems. Corning engineers offer you the benefits of this experience. Send in the coupon or write to the Industrial Division, Corning Glass Works, Corning, N. Y.

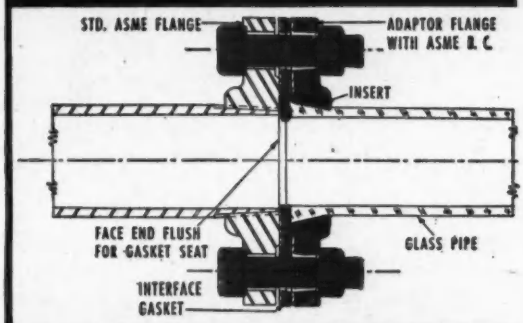
"PYREX" is a registered trade-mark and indicates manufacture by Corning Glass Works, Corning, N. Y.

CORNING Glass Works Corning, New York

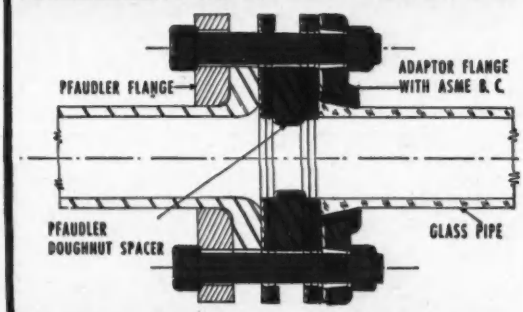
Pyrex Industrial Glass



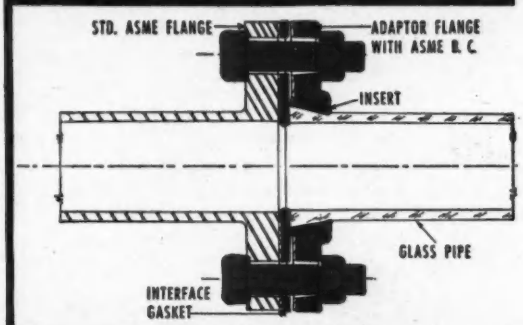
Connection to metal tubing



Connection to A.S.M.E. screwed flange



Connection to Pfaudler enamel-lined



Connection to A.S.M.E. flanged fitting

***Accessory parts in red furnished by Corning**

Corning Glass Works, Industrial Division, Dept. PT
Corning, New York

Gentlemen: I would like glass piping information immediately on the subjects I have checked below. I understand there is no obligation.

☐ Installation Manual ☐ PYREX Valves
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WPB to Stimulate Pulpwood Cutting

WASHINGTON, D. C., October 6, 1943—In an effort to decentralize the pulpwood activities of the War Production Board and expedite production, seven regional aides charged with the responsibility of stimulating pulpwood cutting in the United States and Canada, will be designated shortly, A. B. Hansen, Deputy Director of the WPB Pulp and Paper Division, announced today.

The regions, together with their headquarters, are as follows: the Pacific Northwest, Seattle, Washington; the Great Lakes, Green Bay, Wisconsin; the Northeast, Boston, Massachusetts; the Appalachian, Charleston, West Virginia; the Southeast, Atlanta, Georgia; and the South Central region, New Orleans, Louisiana. Ottawa, Ontario, will be headquarters for the Canadian representative.

The regional aides will be attached to the local regional WPB offices, but their sole function will be to increase and expedite pulpwood production and thus help overcome an estimated 2,500,000 cord shortage which threatens war and essential civilian requirements. They will maintain contacts with pulp mills and pulpwood producers, and act as WPB liaison agents with field offices of OPA, WMC, ODT, and the U. S. Forest and Extension Services of the Department of Agriculture in all problems relating to pulpwood production.

Periodic reports on pulpwood supplies and the progress of pulpwood production programs, including the Victory Pulpwood Campaign benig conducted by newspapers and pulp mills in 27 states will be made to WPB by the regional offices.

In a review of the critical pulpwood situation, sent to pulp mills, Mr. Hansen called attention to the cooperative efforts of the War Production Board and the Department of Agriculture, now implemented by the newspaper and pulpwood consuming industry campaign, to stimulate the production of pulpwood by farmers and small timberland owners in every pulpwood producing county east of the Great Plains.

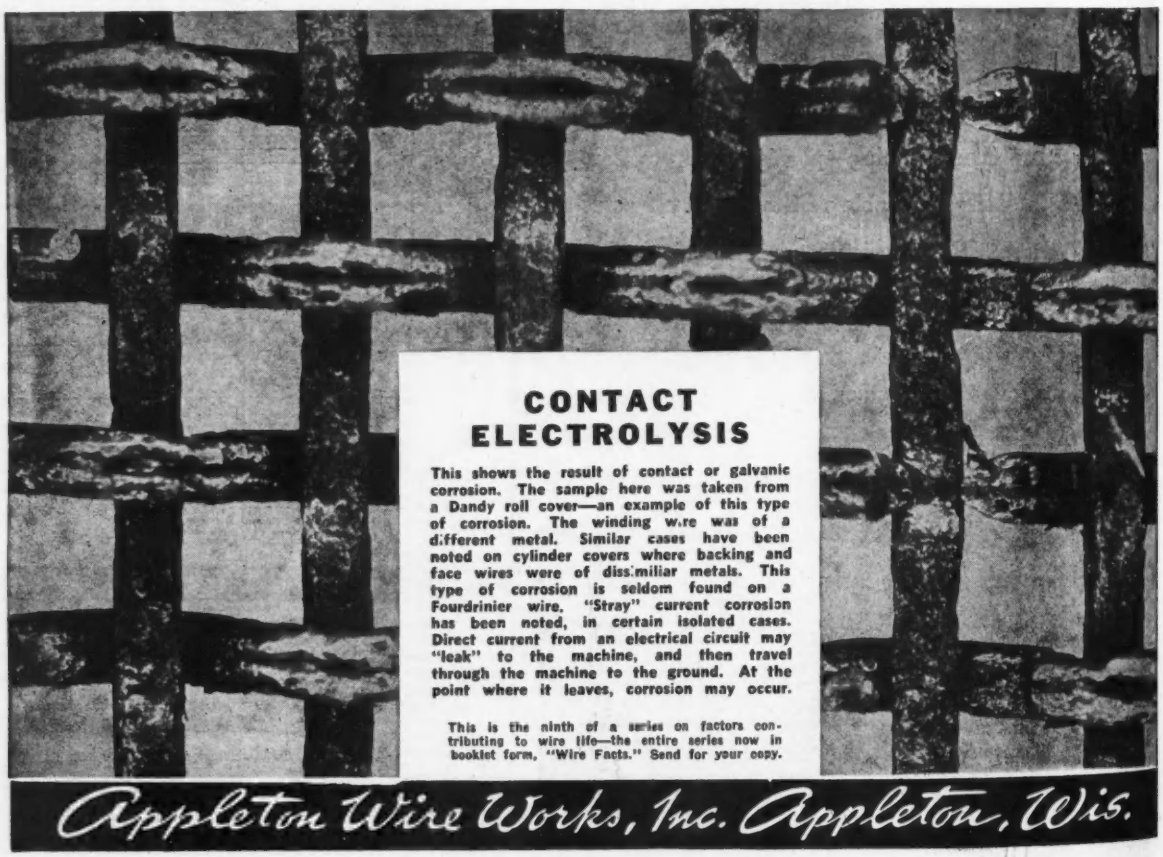
"This program was favorably received by farmers, agricultural officials and the industry," he reported, "and there is evidence that the program has been successful in bringing out a quantity of pulpwood which would not otherwise have been produced."

"Three fundamental factors have been responsible for the lag in pulpwood production, namely manpower shortages, price considerations, and transportation difficulties—especially those involving motor trucks," the report stated. Each of these factors includes many complex subordinate factors which affect production and cut across the nation's entire war economy.

Bonus in Bonds Blocked by WLB

Request by the Western Paper Products Company of 460 W. 5th S. street., to pay bonuses in form of war bonds to its 67 employees has been denied by the regional War Labor Board in Denver, according to a press report.

C. P. Castle, president and general manager of the company, said that he had not yet been advised of the action. The bonuses, he said, were to have been paid in bonds of varying values in accordance with the years of service of the employees, and were to be given in lieu of usual outings and holidays foregone this year because of the manpower shortage.


CONTACT
ELECTROLYSIS
This shows the result of contact or galvanic corrosion. The sample here was taken from a Dandy roll cover—an example of this type of corrosion. The winding wire was of a different metal. Similar cases have been noted on cylinder covers where backing and face wires were of dissimiliar metals. This type of corrosion is seldom found on a Fourdrinier wire. "Stray" current corrosion has been noted, in certain isolated cases. Direct current from an electrical circuit may "leak" to the machine, and then travel through the machine to the ground. At the point where it leaves, corrosion may occur.
This is the ninth of a series on factors contributing to wire life—the entire series now in booklet form, "Wire Facts." Send for your copy.
Appleton Wire Works, Inc. Appleton, Wis.

Ready to stand between your plant and a bunch of saboteurs

Santobrite, Monsanto's highly effective fungicide and bactericide, combats . . . and renders inactive . . . microorganisms that sabotage your war-busy mill by disrupting production, wasting materials and lowering the efficiency of equipment. It puts an end to the causes of slime spots and breaks . . . blinded wires and plugged felts . . . dirty stock . . . clogged water lines . . . rotted felts . . . and many other enemies of good mill operation.

Santobrite is chemically stable, non-corrosive to metals, non-volatile, practically odorless and, when properly handled, its use is no hazard to health of mill operators nor those who use the mill's products.

The use of 0.1 to 1 pound of Santobrite per ton of pulp or paper produced, gives positive protection. The amount used depends upon the extent to which your water system is closed, the characteristics of your stock and the quality of your water supply. No expensive equipment is needed in the application of Santobrite, which comes either as powder or briquettes. Santobrite treatment costs from 1½ to 18 cents per ton of paper or pulp.

Limited amounts of Santobrite are available on priority for continuous anti-slime treatment.

We suggest you write or wire for latest information on availability and use the coupon below for complete information on the use and benefits of Santobrite. Monsanto Chemical Company, Organic Chemicals Division, St. Louis, Missouri.

ARMY (E) NAVY

"E" FOR EXCELLENCE—The Army-Navy "E" burgee with two stars, representing recognition by the Army and the Navy of especially meritorious production of war materials" over a two-year period, flies over Monsanto's executive offices in St. Louis and over Monsanto plants at Anniston, Ala., and Monsanto, Tenn. The Army-Navy Production Award also has been won by five Monsanto plants at St. Louis, Mo., Monsanto, Ill., Karnack, Texas, and Springfield, Mass.

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Please send me, free, a copy of your technical Bulletin O-5 "Santobrite For Microorganism Control In The Pulp And Paper Industry" and other pertinent information.

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Title.....

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City and Zone.....State.....

W. G. MacNaughton Made 1st Lieut.

William G. MacNaughton, Jr., Second Lieutenant Air Corp, Army of the United States, was promoted to First Lieutenant on September 20.

Lieutenant MacNaughton, son of W. G. MacNaughton of the News Print Service Bureau, New York City, has been with the Army Transport Com-

1ST. LIEUT. W. G. MACNAUGHTON, JR.

mand and stationed at New Castle Army Air Base, Wilmington, Del.

Since his graduation as a Navigator November 7, 1942, he has made flights with B-25's to North Africa and C-46's to India.

Before entering Air Corps training, he was employed at Georgetown, S. C., mill of International Paper Company.

Indianapolis Demand Active

[FROM OUR REGULAR CORRESPONDENT]

INDIANAPOLIS, Ind., September 27, 1943—The general paper situation here is little changed from that of a week ago. Thus far the new standards and maximum weights of writing and printing papers have had little effect, good or bad, and litle comment on these changes has been made here. Prices in all lines are firm and little change is expected.

In the wholesale field, there is a fair backlog of orders and the pulp situation is causing much uneasiness. The local trade expects no particular improvement until the war is over.

Building paper and roofing demand was a trifle better last week. The volume for the year is far down in a ten-year average and the year will end as a distinct disappointment. However, building restrictions by the Government are such that litle can be done about it.

Container demand continued heavy last week. Buying on the part of war industries with priority ratings continued high and most of the Indiana production is going to these industries. Waxed containers appear to have declined somewhat with the passage of the summer and the decline in demand from the dairy industry.

Newsprint continued strong last week with most papers buying their maximum quotas under government regulations. Some of the larger papers are turning away advertising because of tightness of the paper supply. It is noticeable that lineage in all the larger papers has shown a distinct percentage in favor of the classified section.

Rags were in good demand last week. Cotton cuttings were active and new whites also were moving. Old cotton rags and roofing grades also were popular with the mills. All grades were strong at ceiling prices.

Waste paper continued to be much in demand. Prices were at ceiling levels. Local paper stoik executives say there is more attention being given now to the collection of paper. They are handicapped, however, by lack of help to aid in collections.

Asks WPB Views on Newsprint

WASHINGTON, October 4, 1943—The House Committee investigating the shortage of newsprint laid about a dozen questions today before Donald M. Nelson, chairman of the War Production Board, all based on the announced thesis that sufficient newsprint "must be kept available to maintain the services of the free press in the United States."

In a letter to the WPB chief, Chairman Lyle Boren, Democrat, of Oklahoma, said that reductions ordered and proposed would impose a hardship on some newspapers and restrict newspaper service in some communities.

"We do not wish to accept the inevitability of further curtailments without closest consideration of all the facts and without being convinced that every proper thing which can be done is being done to maintain the supply of newsprint for newspapers," the letter added.

The question went to the point of what could be done and is being done in the situation. The letter asked Mr. Nelson or a representative to appear before the committee when it resumes hearings Thursday.

One question asked what is being done to conserve and reduce consumption involving less essential uses of paper and paper products which would increase the amount of pulpwood for newspapers.

Another inquired why the Lend-Lease Administration and the Office of Economic Warfare were reported as expecting to ship 48,000 tons of newsprint abroad this year, when Canada has greater newsprint resources than the Untied States, and also inquired the destination of this newsprint.

A third asked if Mr. Nelson believed, in view of the shortage, that Government agencies could not get along with less than the 998,000-ton requirement estimated by him for this year in a letter of May 10.

May Establish Chipping Plant

[FROM OUR REGULAR CORRESPONDENT]

VANCOUVER, B. C., October 1, 1943—Establishment of a chipping plant to supply material for pulp mills is under consideration by the International Pulpwood Supply Company, an extra-provincial firm with registered offices at Vancouver.

According to information received by the Victoria solicitors for the company, the concern plans an investment of between $100,000 and $125,000.

The firm is making an application for an easement to erect a conveyor over a portion of Harbor road. It seeks a location on C. N. R. land on Harbor road together with foreshore lots at the location.

Tells of Process to Make Newsprint

A press dispatch from Chicago states that Elbert Antrim, assistant business manager of *The Chicago Tribune*, asserting that old newspapers could be reprocessed into new newsprint, is urging that the Government permit a demonstration of the process which, he contends, would help solve the country's paper shortage.

"'If this process were allowed to proceed unhampered by Government restrictions,' he said, ''a large part of the newsprint manufacturing industry would return to the United States'."

He said that a British process patented in 1936 had been installed in several mills in England "with complete success," and added:

"'In laboratory tests paper has been made of the same waste eighty times, adding only sufficient new pulp to replace the small percentage of short fiber losses.

"'De-inking is said to be complete and colored papers can be bleached with small expense and without the use of chemicals.

"'The process reacts upon the clean fibers in such a way as to make them more susceptible to weak chemical solutions than they were originally, so that artificial silk, explosives, etc., can be made from waste papers composed of materials originally unsuited for such purposes'."

"Mr. Antrim said that one newspaper publisher had been collaborating with various paper manufacturers on the problem of reprocessing old newspapers into new newsprint and had applied to the printing and publishing division of the War Production Board for permission to conduct a reclamation experiment and to allow the resulting newsprint to be added to the publisher's consumption quota. This application, he said, was denied by the WPB."

Mead Corp. Acquires Manistique

[FROM OUR REGULAR CORRESPONDENT]

ESCANABA, Mich., October 4, 1943 — The Mead Corporation of Dayton and New York, one of the largest paper manufacturers in the world, has acquired from the Minneapolis Tribune Company, of Minneapolis, all of the outstanding capital stock of the Manistique Pulp and Paper Company and the Manistique Light and Power Company. The Mead Corporation also owns and operates the Escanaba Paper Company at Groos, as well as numerous other paper mills throughout the country.

It was announced by the Mead Corporation that R. G. Hentschell of Manistique, who has been general manager of the Manistique Pulp and Paper Company and the Manistique Light and Power Company for many years, will continue in that capacity.

The newly elected officers and directors of the Manistique Pulp and Paper Company and the Manistique Light and Power Company are: George B. Bickelhaupt, director, Minneapolis; M. N. Smith, president and director, Escanaba; E. G. Bennett, vice president and director, Escanaba; Al H. Mahrt, treasurer and director, Chillicothe, Ohio; F. D. Schnacke, secretary and director, Dayton, Ohio.

Yes, a sort of monopoly on

chipper knives

For one thing, Heppenstall Chipper Knives are completely Heppenstall built—from the patented analysis steel to the final, polished, perfect blades.

Yes, we monopolize the making of Heppenstall Chipper Knives—otherwise we couldn't be so positive about our *guarantee* ". . . that they will show a unit cost below any other chipper knives on the market . . ."

We also monopolize, to a certain extent, the *quality market* for Chipper Knives. Because, after all, if any product consistently delivers *better* service than the most exacting users would normally expect of it—the maker of it is bound to enjoy a preferred position among discriminating buyers—and this is a pretty solid reason why *you* should think of Heppenstall when *your* knives need replacement.

Heppenstall Company

Forging Fine Steels For More Than Fifty Years

PAPER TRADE JOURNAL

Thos. Reg. U. S. Pat. Off.

Henry J. Berger
EDITOR

Vol. 117 October 7, 1943 No. 15

COMING EVENTS IN PAPER INDUSTRY

New England Section. Technical Association of the Pulp and Paper Industry—Third Friday of each month at the Roger Smith Hotel, Holyoke, Mass.

Delaware Valley Section. Technical Association of the Pulp and Paper Industry—First Friday of each month at the Engineers Club, Philadelphia, Pa.

Lake States Section. Technical Association of the Pulp and Paper Industry—Second Tuesday of each month at the Conway Hotel, Appleton, Wis.

Kalamazoo Valley Section. Technical Association of the Pulp and Paper Industry—First Thursday of each month at the Park, American Hotel, Kalamazoo, Mich.

RENEGOTIATION OF CONTRACTS

The measures taken by the government in the renegotiation of war contracts will have a profound effect upon post-war recovery. Since the adoption of Section 403 of Public Act No. 528 in Congress, April 28, 1942, the legislation has been frequently and severely criticized. This dissent has come not only from business men but from congressional and administrative circles. The object of the Act is to prevent anyone from making excessive profits from the war. The law was substituted for the inequitable Case Amendment of 1942 which would have imposed arbitrary profit limitations before taxes, ranging from 10% down to 2% as the volume of war orders increased. Although almost all business men are in agreement with the government departments, Army, Navy, etc., that no one should profit unduly from the war, it is widely contended that the renegotiation act should be amended to provide industry an opportunity to make and retain profits adequate to the vital employment of such surplus funds to successfully meet the difficult readjustment problems which must be faced in the transitory period from war to peace-time production.

In reviewing the subject of the renegotiation of war contracts, the resolutions committee of the National Chamber War Council, at its annual meeting in New York last spring, adopted resolutions which closely parallel the opinion of a large number of business men. The resolutions state: "Industry has insisted that there must be no excessive profits on war contracts. It is the highest public interest that war requirements be met at the lowest possible cost that include a reasonable return. The principles and procedure by which these objectives are to be attained present the only issue of importance. The prevention of excessive profits on war contracts presents two entirely separate and distinct problems: (1) the negotiation of prices, which is a procurement problem; and (2) the recapture of excessive profits already realized, which is a problem of taxation. The sound fundamental position is that profits already earned should be recaptured only through taxation, under policies and procedure prescribed by the Congress. The provisions of the present renegotiation statute, authorizing recapture under policies and procedure prescribed by administrative action, should be repealed. Should there be a high limited number of unusual cases in which the high rates of the present Revenue Act prove inadequate, then amendments should be adopted to correct its deficiencies."

In testifying before the House Ways and Means Committee hearings on the Renegotiation Statute, James S. Lincoln, president of the Lincoln Electric Company, of Cleveland, Ohio, charged that "Five people on the Price Adjustment Board have the power at their whim to destroy any industry in the United States. They have already laid the groundwork for such destruction in many cases. There is no recourse from their decision. Such powers have never before been given to any group of men in the history of the United States. The fundamental principle of our republic—recourse to the courts of justice—has been eliminated." Mr. Lincoln urged repeal of the law as "any reason for it has long since disappeared." Charging "gross deception" in claims of the renegotiation boards of saving $4 billion, Mr. Lincoln estimated all but $400 million of this sum has "already been captured by the tax law. Even if the amount claimed by the Board had been recovered, it has been lost many times over by the inefficiency forced on industry by renegotiation. As the law is being administered by the Board, efficiency is penalized; inefficiency is rewarded. No efficient organization can escape and no organization which is sufficiently inefficient has yet been renegotiated. The lagging of the war effort, almost daily reported by WPB and the Administration, is the direct result of this interference. All the services have the experience necessary to accurately price war contracts. The hundreds of millions of dollars of contracts placed since the war began have given them all the experience necessary to accurately determine proper prices for any contract. Those which have been placed in error before can be cancelled and reissued at the proper firm price. Only so can incentive efficiency, so vitally needed, be restored."

In its protest before the House Ways and Means Committee the Automotive Tool and Die Manufacturers Association, of Detroit, Mich., said in part: "Because the present Renegotiation Act makes no provision for the setting up of reserves and because the present administration of the Renegotiations Act is leaving us with very little profit after taxes, we shall be forced at the termination of the war and even before, virtually to abandon a great part, if not all of

our expanded facilities, thus throwing many skilled workers out of work and depriving industry at large of many contributions that we might otherwise be able to make in the way of new development."

In suggesting five amendments to the Renegotiation Act, Henry W. Jones, Jr., president of the American Tube Bending Company, of New Haven, Conn. said in part: "The people of this country recognize the part industry has played in the war. They also recognize that the hope of the post-war period lies in the ability of industry to give employment. The Congress recognizes this fact. . . . Industry can only provide this employment if it can convert, rehabilitate, and employ during the transition from war to peace, and to do these things it needs liquid reserves. . . . In the past industry has pleaded for the ability to establish these reserves. I look at it from a different point of view. If my premises are correct, then it is the duty of the Congress to make such reserves mandatory. If these are not spent for the purpose for which they were accumulated, then they should be subject to taxation at the rates in effect the year they were set up."

Distributes Great Northern Stock

Blyth & Co. of New York has effected secondary distribution of a block of 6,000 common shares of Great Northern Paper Company at 34½ with a concession of $1 a share to members of the National Association of Securities Dealers.

Production Ratio Report*

(Production as per cent of six-day capacity)

COMPARATIVE WEEKLY SUMMARIES

Current Weeks—1943		Corresponding Weeks—1942	
August 21	90.9	August 22	81.2
August 28	91.5	August 29	83.3
September 4	91.4	September 5	83.3
September 11	75.7	September 12	70.3
(Holiday Sept. 6)			
September 18	92.4	September 19	85.2
September 25	*92.1*	September 26	87.2

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July
1942	104.5	103.9	102.9	100.4	95.3	87.4	75.8
1943	87.2	88.9	89.5	88.7	91.5	86.5	84.4
1942		80.8	82.8	90.6	86.9	80.1	90.4
1943		*91.1*	..	....	....	....	....

COMPARATIVE YEARLY SUMMARIES

	1936	1937	1938	1939	1940	1941	1942	1943
Year to Date..	78.2	86.1	69.4	79.5	86.2	95.0	92.2	88.4
Year Average..	80.4	79.8	71.5	83.4	85.6	97.4	90.4	....

*Based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

PAPERBOARD OPERATING RATIOS†

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1937	83	89	89	91	88	80	69	77	72	70	57	47	75
1938	56	63	63	60	60	59	59	60	70	73	67	61	64
1939	65	73	76	74	69	73	68	77	82	91	88	77	77
1940	78	75	74	76	82	85	77	79	78	85	82	77	78
1941	81	88	89	89	91	94	92	98	95	99	98	90	92
1942	102	101	101	95	82	72	68	75	76	81	82	77	84
1943	86	88	94	94	96	94	89	*96*	..	..	..	..	..

Week ending Aug. 21, 1943—95
Week ending Aug. 28, 1943—96
Week ending Sept. 4, 1943—97
Week ending Sept. 11, 1943—83
Week ending Sept. 18, 1943—98
Week ending Sept. 25, 1943—*96*

†Per cents of operation based on "Inch-Hours" reported to the National Paperboard Assn.

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Spectrophotometric Analyses of Starches*

By Ralph W. Kerr* and O. R. Trubell*

Abstract

The utility of starch as a size or adhesive depends upon the characteristics of the component polysaccharides in the starch. All starches, particularly modified ones, do not exhibit the same relative proportions of constituents.

A method of analysis is developed for the two major components of starch called "amylose" and "amylopectin." This method involves staining with iodine and a spectrophotometric analysis of the color produced. The method is based on the observation that the linear polymer, "amylose" stains blue, whereas the branched polymer "amylopectin" stains a reddish-purple.

The fundamental, as well as the practical, significance of the analytical results obtained is discussed. The method should be applicable in routine testing starch products and in controlling starch modifications made in paper mills.

Maquenne and Roux *(1)* proposed that the starches are heterogeneous in the sense that they contain two components which differ from each other in their chemical configuration. One is composed of maltose residues and is hydrolyzed by diastase into yields which approach 100% of the theoretical for a chain of maltose anhydrides. This component, subsequently called amylose, is colored an intense blue with iodine; the color being considerably more intense than that obtained with parent starch. Investigations reported by many workers in recent years have confirmed these findings.

Maquenne and Roux attempted to utilize the coloration of amylose with iodine, to determine the relative proportion of amylose and the other hypothetical component, termed by them amylopectin, in the native starch. It was assumed that the latter component gave no coloration with iodine. By colorimetric methods, starch was found to contain 80% amylose and 20% amylopectin *(1, 2)*.

It is unfortunate that no better methods for evaluating colors were available to these workers. It is also unfortunate that their colorimetric data checked so well with their diastatic analysis of starch in which 80% of starch is converted to maltose by malt diastase. The erroneous impression concerning the composition of the starches, upon which much of the philosophy of starch during the next three decades was based, must, of course, be once and for all discarded in view of the recent findings by Schoch *(3)* and by Bates, Rundle, and French *(4)*.

Simerl and Browning *(5)* have attempted to apply the spectrophotometer to analyze the color which results when starch and starch products are stained with iodine. All of the industrial starches studied by them gave a blue coloration which resulted in a minimum per cent light transmission in the neighborhood of 600 mmu wavelength. Starch concentration does not effect the position of the minimum in the light absorption curve. Beer's Law: Log of the fractional transmission is proportional to (starch) concentration, was found to hold over a wide range of per cent light transmission. Simerl and Browning find that the blue iodine coloration is produced by that fraction of corn starch, which precipitates in the electrosedimentation of its paste. It is termed by them, alpha amylose according to the nomenclature used by Taylor. It is undoubtedly a fraction of the linear components of corn starch, or an amylose, as it is more conveniently called. This fraction gives an exceptionally low, minimum per cent light transmission at about 600 mmu. The non sedimenting (or branched) fraction of corn starch, — beta amylose, according to Simerl and Browning, — shows a very high per cent light transmission at wave lengths between 600 and 700 mmu and the per cent light transmission falls off as the wave length is decreased to 400 millimicrons.

Considering the fractionation technique employed (which would probably give the opposite results with potato starch)[1] it is remarkable that these workers should have obtained such clear cut results in demonstrating that the fraction which we now believe to contain predominately linear configurations, should be the blue color forming constituent, with iodine. So sharp are the results, that one might use the data of Simerl and Browning to estimate the relative proportions of the two fractions in corn starch — the predominately branched and the predominately linear. So calculated, these results would be 73% and 27% respectively, which is surprisingly close to values obtained by other means *(3, 4)*.

Development of the Spectrophotometric Method of Analysis

We have checked the above given results by the use of extensively purified starch constituents and have attempted to utilize the fact that components of starch give different per cent light transmissions

* Contribution from the Research Laboratories of the Corn Products Refining Company, Argo, Ill.

[1] For the use of electrosedimentation to precipitate the *amylopectin* fraction of potato starch reference is made to the extensive works of M. Samec and in particular to Hess and Krajnc (12).

when stained with iodine, to develop a spectrophotometric method for the analysis of such constituents. Using pure, crystalline amyloses obtained by Kerr *(6)* from corn, potato and tapioca starches, it has been found that in all cases the minimum per cent light transmission occurs at the same range of wave length, which is in the neighborhood of 600 to 620 mmu. Plotting the log of the per cent light transmission against the concentration of amylose used, fairly straight lines are obtained over a considerable portion of the range of per cent light transmission studied, as is shown in Fig. 1. As might be anticipated, the purified corn constituent shows the most noticeable variation from Beer's Law in the extreme ranges, whereas the tapioca amylose, being the most colloidally stable, gives the most nearly linear relationship. For some reason, not as yet entirely clear, the slopes of the three curves are all slightly different and both potato and tapioca crystalline amyloses give slightly lower, minimum per cent light transmissions at a given concentration than corn crystalline amylose. However, it may be concluded that wide variations in molecular magnitude cause only small deviations in the function. Log per cent light transmission: concentration, since it is apparent from the work of Foster and Hixon *(8)* that, on the average, the "chain length" of both potato and tapioca amyloses are more than double that of the correspondingly obtained corn amylose. On the other hand, chain lengths less than about 25 glucopyranose units give very weak colorations, since Naegeli's amylodextrin with iodine, gives a relatively high per cent light transmission at 600 millimicrons.

Purified amylopectin fractions *(6)* — i.e., fractions of more complexly constituted molecules of starch— when freed from the last traces of the essentially

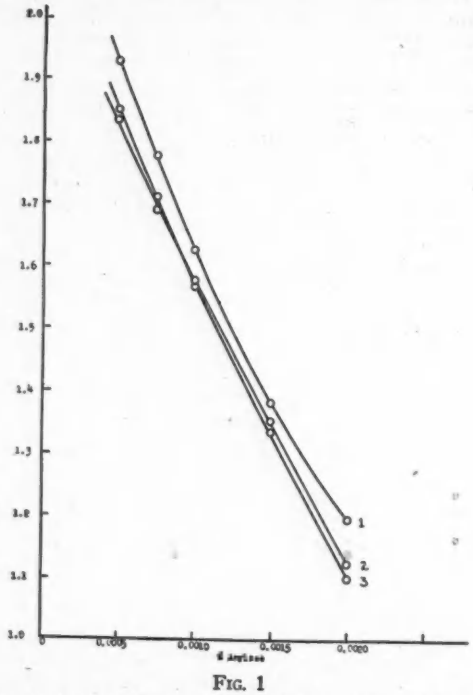

FIG. 1

Variation in Log % Transmission with Concentration of Various Crystalline Amyloses
Vertical Ordinate: Log % Transmission 1.0, 1.1, 1.2, etc., to 2.0
Horizontal Ordinate: % Concentration of Amylose 0, 0.0005, 0.0010, 0.0015, 0.0020
1. Corn, Crystalline Amylose; 2. Potato, Crystalline Amylose; 3. Tapioca, Crystalline Amylose

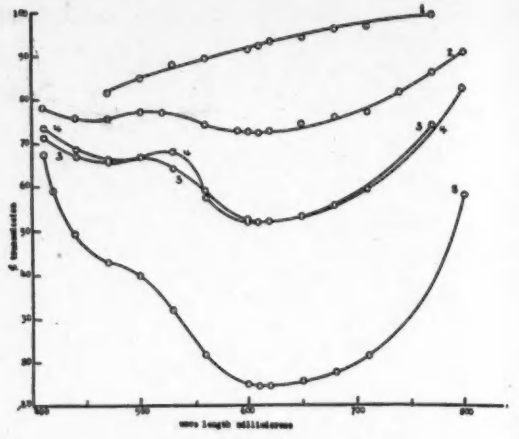

FIG. 2

Variation in % Transmission with Wavelength for Corn Starch and Its Fractions at 0.002% Concentration
Vertical Ordinate: % Transmission 10, 20, 30, etc., to 100%
Horizontal Ordinate: Wavelength in Millimicrons 400, 500, 600, 700 and 800
1. Corn, "Amylopectin"; 2. Corn Starch, "Intermediate Fraction"; 3. Defatted Corn Starch; 4. 30% Crystalline Amylose + 70% "Amylopectin"; 5. Corn, Crystalline Amylose

linear chains by adsorption of the latter on cotton, give a reddish color with iodine and a high per cent light transmission in the wave band, 600 to 700 mmu, as is shown in Fig. 2. "Intermediate fractions" of starch give bluish colorations with iodine of considerably less intensity than crystalline amyloses, as will be noted in Fig. 2. They too, give a minimum per cent light transmission at about 600 mmu. By "intermediate fraction" is meant one which is obtained by the addition of butanol, or limited amounts of butanol and methanol to solutions or dispersions of the residual starch which remains after removing the most simply constituted chains from starch by procedures such as, for example, extraction with water at 70° C. The results obtained with one intermediate fraction from corn starch is shown in Curve 2, Fig. 2. It is obtained by saturating a corn starch dispersion with butanol, supercentrifuging the precipitable, "linear" fraction, then adding in all, 14.5% butanol and 13% methanol, by volume, to the reheated centrifugate and recrystallizing the second precipitate (which forms on cooling) several times from hot water to which the same ratio of, first butanol, and then methanol, are added. This fraction represents nearly 50% of the total weight of corn starch and has a beta amylase conversion limit of 60% to maltose *(7)*.

The above results might be interpreted to mean that no fractions exist in starch, intermediate in structure between linear, and branched according to one definite pattern. Stated differently, there are no gradations in structure such as might be represented by molecules less branched than those of amylopectin. Or the results might be interpreted to mean that if intermediate variations in structure exist and if sections of these molecules are sufficiently linear and of sufficient length, they too may give a coloration with iodine which results in a minimum per cent light transmission at approximately 600 mmu.

Analysis of Corn, Potato and Tapioca Starches

In Fig. 3, the results obtained with various combinations of pure, corn crystalline amylose and a highly purified and possibly most complexly constituted frac-

tion of corn starch are shown. A total carbohydrate concentration of 0.002 grams per 100 cc. was used in all cases. The log of the per cent light transmission at 610 mmu was determined and plotted against the per cent "amylose" and the per cent "amylopectin" known to be present in the various mixtures.

On the assumption that only two types of configuration exist in corn starch, linear and branched, and on the assumption that any variation in the two types does not materially alter the function, log per cent transmission corresponding to carbohydrate concentration, then the results in Fig. 3 may be used to estimate the relative proportions of each type in corn starch. A value for the per cent transmission was obtained for whole corn starch, similarly solubilized and at like concentration. This value was placed on the curve in Fig. 3 and is the solid dot shown. This point corresponds to a percentage composition of 25.5% "amylose" and 74.5% "amylopectin" for the whole corn starch, untreated. Corn starch, defatted by refluxing four successive times with 85% methanol *(9)*, at the boiling point, for four hours, gives values as high as 29% linear components. The per cent light transmission at various wave lengths for such a starch is also plotted in Fig. 2. It is similar in shape to that for untreated corn starch. But the lower values obtained for the defatted starch may be explainable by the possibility that the fat present may affect the dispersion of the linear chains of the untreated starch, or the fat may affect the ability of the amylose to orient with iodine *(10)*.

Using the same technique of alcoholic fractionation to prepare the end members of both potato amylopectin and tapioca amylopectin fractions and applying the spectrophotometric method described for corn starch, it was found that potato starch contains 25.5% amylose and 74.5% amylopectin[2]. Tapioca starch was found to contain 20.0% amylose and 80% amylopectin. Several samples of each type of starch, prepared in different localities, were analyzed. For example, both a Javanese sample of tapioca starch and one made in Santo Domingo, were inspected. The results

[2] By an analogus spectrophotometric procedure, R. M. McCready and W. Z. Hassid (*J. Am. Chem. Soc.*, 65:1154 (1943)) have very recently approximated the analysis of potato starch. Their results are 20% "amylose" and 80% "amylopectin".

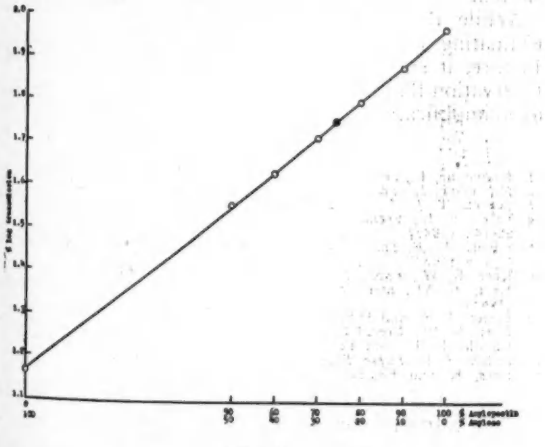

FIG. 3

Log % Transmission at 610 mmu for known mixtures of Corn Crystalline Amylose and Corn "Amylopectin." Solid Circle is Whole Corn Starch, (not defatted)

Vertical Ordinate: Log % Transmission, 1.1, 1.2, 1.3, etc., to 2.0

Horizontal Ordinate:						
.0	50	60	70	80	90	100% Amylopectin
100	50	40	30	20	10	0% Amylose

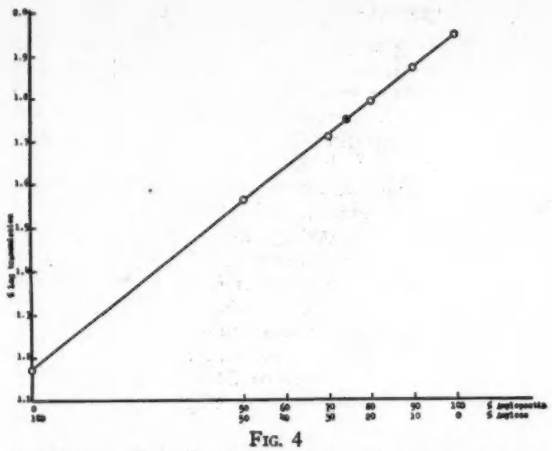

FIG. 4

Log % Transmission at 610 mmu for known mixtures of Potato Crystalline Amylose and Potato "Amylopectin." Solid Circle is Whole Potato Starch

Vertical Ordinate: Log % Transmission 1.1, 1.2, 1.3, etc., to 2.0

Horizontal Ordinate:						
.0	50	60	70	80	90	100% Amylopectin
100	50	40	30	20	10	0% Amylose

with each starch tested did not vary more than a half of 1% from any other of the same species of starch. All results are expressed on a moisture-free basis.

The analytical data for potato and tapioca starches are graphed in Figs. 4 and 5, respectively. The results obtained with the three starches mentioned require that previous estimations of starch composition *(3, 4, 6)* in respect to amylose and amylopectin, be revised.

Waxy maize starch was examined and found to give 94.1% light transmission at 610 mmu using 0.002% starch and prepared as described above with iodine. This value is of the same order of magnitude as the per cent light transmission for the best amylopectins and iodine at 610 mmu. It may be assumed therefore, that this starch is substantially free from "amylose." This result checks our findings using a gravimetric method of analysis, involving hot water extraction and butanol precipitation of the concentrated extract.

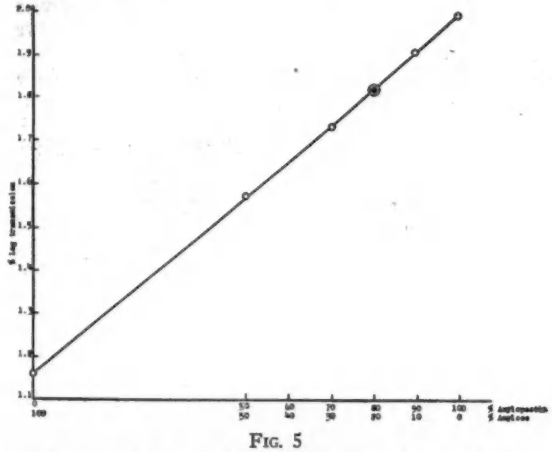

FIG. 5

Log % Transmission at 610 mmu for known mixtures of Tapioca Crystalline Amylose and Tapioca "Amylopectin." Solid Circle is Whole Tapioca Starch

Vertical Ordinate: Log % Transmission 1.1, 1.2, 1.3, etc., to 2.0

Horizontal Ordinate:						
.0	50	60	70	80	90	100% Amylopectin
100	50	40	30	20	10	0% Amylose

Experimental Details of Method

Exactly 0.1 gram, dry basis, starch or starch product is dissolved at room temperature in 10 ml. 0.67 *N*. NaOH. When solution is complete, the liquid is transferred to a 2-1. volumetric flask with about 1.5-1. of water. The solution is adjusted to pH 5.0 with HCl. A standard I + KI solution is made up containing 0.5 grams of iodine and 0.75 grams of KI in 100 ml. water solution and 20 ml. of this standard iodine solution is added to the solution of starch. After mixing, the starch-iodine solution is made up to 2 liters. Portions of the starch-iodine solution are diluted with water to adjust them to the final concentrations used. Standardization curves, such as Figs. 3, 4, and 5 were made in all cases using a carbohydrate concentration of 0.002%. The solutions are made up and kept in glass stoppered volumetric flasks.

For measurement of the per cent light transmissions a Coleman, model 10-S spectrophotometer was used. Wavelengths may be adjusted with this instrument in increments of 10 mmu over the range of wavelengths of 350 to 1000 mmu. By inclusion of a suitable control, which is assumed to give 100% light transmission, the instrument may be standardized so that readings taken on unknown solutions may be read directly in per cent light transmission for any given wave length. The starch solution was taken to give 100% transmission. Using 0.002% starch the colors were found to remain constant over several hours time when stored in glass-stoppered bottles.

For the analysis of corn, tapioca and potato starch products the standardization curves appended may be used. The unknown is dissolved, stained and diluted to 0.002% in the manner above indicated and its per cent light transmission determined at 610 mmu wavelength. The composition of the product in terms of "amylose" fraction and "amylopectin" fraction may then be estimated by locating the position of the value for its per cent light transmission on the standard curve and noting the composition to which this point corresponds.

Limitations of the Method of Analysis

However, two deficiencies in the method of analysis are apparent from the following considerations. Curve 4 in Fig. 2 shows the values obtained using a combination of 30% corn, crystalline amylose and 70% purified amylopectin. It does not have a shape identical to the corn starch, shown in Curve 3. Furthermore, the intermediate, corn starch fraction, results with which are given in Curve 2, Fig. 2 gives the same diastatic analysis as corn starch. Its beta amylase "conversion limit" to maltose, after three recrystallizations from a mixture of 100 parts, by volume, of water, 20 parts butanol and 18 parts methanol is 58.7, 60.9 and 59.6% respectively. It should therefore be composed of the same proportions of the purified amylose and amylopectin as parent starch, if indeed there are only two constituents in corn starch. But applying the above described method of analyses, by utilizing the results for mixtures, plotted in Fig. 3, this intermediate fraction analyzes only 13% "amylose." Obviously either the method is not entirely adequate, or else it is based on assumptions which are not entirely valid.

An alternative explanation might be that "intermediate" fractions of starch are not physical mixtures of the two extreme types but are rather of "intermediate" configurations between a perfectly linear chain and a highly branched configuration. These intermediate configurations may be sufficiently "linear" to stain blue with iodine but the per cent light transmission at 600 mmu may not bear the same relationship to its concentration as the relationship given by perfectly linear fractions. For the present, at least, it would be safer to view the method proposed as one for the analysis of starch in terms of its two major component fractions, rather than an analysis for two definite components. The fundamental issue involved, whether there are more than two molecular patterns in any one starch, is being further studied in our laboratories.

Application of the Method to Starch Products

Kerr *(6)* has discussed the probable utility for paper manufacture of the two different molecular species of the starches as they occur in starch products or modified starches. It is already known *(6)* that some methods used to modify starch, preferentially modify one type of constituent or the other, or at least, change the relative proportions of the two component fractions during the modification. It may be desirable, therefore, to correlate the working properties of a premodified starch in terms of composition or it may be desirable that the paper technologist be enabled to control starch modifications in respect to amylose degradation when enzymes are used as has been suggested by Gillan *(11)*. The method described above offers a relatively quick procedure for the analyses of starches in terms of its two major fractions, and this method is entirely suited for routine testing.

Conclusions

Spectrophotometric analyses of the colors produced by iodine and starch, or starch fractions, have been presented.

From data obtained in studies of the per cent light transmission, using the crystalline amyloses of various starches and their corresponding, highly purified amylopectin members, the analyses of several starches are given in terms of "amylose" and "amylopectin", content.

While the method probably possesses utility in evaluating various starch products for paper manufacture, it should be used for the present with the reservation that the analytical results are probably an oversimplification of the composition of starch.

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Elgin Deconcentrator System

Boiler water conditioning is discussed in Bulletin 504, isued by the Elgin Softener Corporation, Elgin, Ill. It describes the Elgin Deconcentrator System, explains how impurities accumulate, the operation of the company's sludge deconcentrator and other equipment and the scope of the company's service.

The Pulping of Extracted Yellow Pine Wood Chips*

By Otto Kress[1] and Robert H. Mosher[2]

Abstract

Solvent-extracted rootwood of southern pine was cooked by the kraft process under conditions which were varied over the commercial range; in no case was a yield of over 37% (on the basis of the extractive-free material) obtained; this is equivalent to 30% on the basis of the moisture-free chips. The maximum strength of the rootwood pulp was about 50% of that of normal jack pine kraft pulp. The low yield of pulp seems to be the result of a degraded condition of the wood prior to solvent extraction; this is indicated by such tests as cuprammonium viscosity, copper number, and alkali solubility. The presence of extractives in the wood appears to cause a modification in the mechanism of pulping, because the woods containing such extractives gave lower yields and pulps with lower strength values than the extractive-free wood. The fibers of the pulps obtained from rootwood hydrate immediately upon contact with water but do not develop normal strength on beating.

At the present time large quantities of naval stores are obtained by extracting stumpwood of southern pines with a volatile solvent, producing as a byproduct so-called extracted chips.

In the basic extraction process, as described by Croswell and Rockwell (*1*), the stumps are either dynamited out of the ground or "pushed and pulled" by a bulldozer and then trucked to the extraction plant. The wood is chipped and hogged to a small size in order to obtain maximum efficiency of extraction. From the hog storage bin the chips go to the extractors (generally large units operated in series), where the wood is treated with a petroleum or other special solvent. After extraction the solvent is drained off, and with it the dissolved resins, pine oil, and turpentines, as well as some pitch and other extractives. A large proportion of the solvent remains adsorbed or absorbed in the chips and, consequently, the unit is treated with steam for the recovery of this valuable solvent. Generally, over 99.5% of the solvent is recovered. Following this treatment, the spent chips are discharged. Since in most processes there are approximately 4 tons of waste wood for every ton of resins and turpentine produced, there is a large potential byproduct in this spent wood.

The first plant erected for extracting rootwood was built by the Yaryan Naval Stores Company at Gulfport in 1909 (*2*); this was able to handle 175 tons of wood a day. It was taken over by the Hercules Powder Company in 1921 and the capacity greatly increased. Numerous other plants have been built since that time, including developments at Hattiesburg, Newport, and Laurel.

With the erection of these plants, more attention was given to the waste wood. At first it was burned. Because the spent wood represented a chipped material with uniform resin and moisture contents, which could be obtained at a low price [$2.00-3.00 per ton (*3*)], experiments have been made to pulp this waste product. In most cases, however, this is as far as the development progressed, because the wood gave a low yield of pulp with poor strength properties.

In 1918, Kress and Textor (*4*) at the Forest Products Laboratory cooked the spent chips and concluded that the chips did not give a commercial pulp, mainly because of the degradation caused by the solvent recovery steaming process. A later investigation was carried on by Greenwood for Pine Waste, Incorporated (*5*), from which he concluded that the chips, after some modifications in the chipping and extracting processes, could be economically pulped. Although many investigators have worked on the problem of the utilization of the spent wood and considerable money has been spent in conducting research on its commercial possibilities, no organization has, up to the present, successfully produced a chemical pulp commercially which could compete with normal southern kraft.

The spent wood has been ground for the production of fiber suitable for roofing felt, insulating board, or similar products, and this industry flourished until the introduction of the Asplund and other defibrators. These made it possible for a mill to grind its own fiber from local waste cheaper than it could buy the defibered rootwood. There are still a few mills making insulating and wallboard which operate in conjunction with an extraction plant (*6*), but very few of them utilize the total output of available spent chips.

Presentation of the Problem

Although considerable work has been done on the pulping of the solvent-extracted wood, the study of the basic reasons for the poor yield and low strength of the resulting pulps has been rather limited.

In the extraction process there are four possible causes of degradation of the wood:

(1) The small size to which the wood is comminuted in order to obtain maximum extraction efficiency results in a degraded wood which is more easily attacked by the cooking liquor.
(2) During the extraction process the wood is dehydrated below the fiber saturation point by the hot solvent, and is perhaps physically or chemically degraded.
(3) The final treatment by superheated steam degrades the wood, affecting the colloidal characteristics in a manner similar to the oven drying of wood.
(4) The rootwood as received at the extraction plant represents an inferior material from the pulping standpoint, possibly similar in characteristics to decayed wood.

In the choice of a pulping process there was a limited range of possibilities, as the acid cooking methods can be eliminated because of the presence in the wood of varying amounts of extractives. Even after the extraction process, a certain quantity of extractives is present because different solvents have a selective action and practically none of them remove all of the

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* Presented at the Army and Navy Requirements Conference of the Technical Association of the Pulp and Paper Industry, Palmer House, Chicago, Ill., Sept. 21-24, 1943.
A portion of a thesis submitted by the junior author in partial fulfilment of the requirements of The Institute of Paper Chemistry for the degree of Master of Science from Lawrence College, Appleton, Wis., May, 1942.

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[2] Student, The Institute of Paper Chemistry, Appleton, Wis. Present address: Monsanto Chemical Company, Plastics Division, Springfield, Mass.

extractible matter *(2)*. Consequently, there are only the alkaline cooking methods to study and, since a stronger pulp is obtained by the kraft process, this was investigated. By making a series of experimental cooks and varying the four standard cooking factors—(1) unit weight of chemical per unit weight of wood, (2) temperature and, therefore, pressure of steaming, (3) total liquor volume, (4) length of time of cook—the total cooking range was investigated to determine whether this wood could be pulped under normal conditions.

Raw Materials

Since this problem is related directly to the naval stores industry, it was desirable in the experimental work to use wood which had been commercially extracted.

A batch of solvent-extracted chips and a corresponding batch of unextracted chips were obtained through the courtesy of the Continental Turpentine and Rosin Corporation of Laurel, Mississippi. These samples were taken directly from the processed material and, therefore, are representative of it.

To prepare the chips, the stumpwood is put through a double anvil hog which breaks it down into coarse fragments, which are then reduced in a hammer mill shredder to the size requisite for extraction. The chips are loaded into the extractors and treated with a petroleum naphtha solvent boiling between 205°-238° F. The solvent is preheated, pumped in at about 190°-195° F., and then boiled in the extractors by the use of steam coils. The boiling is carried out to remove all the moisture from the chips since, as long as any water is present, there is incomplete extraction because of the immiscibility of gasoline and water. The maximum temperature reached during this period is about 250° F.

After the extraction has been carried to its economic limit, the liquid containing the dissolved material is drained off and steam is injected into the extractor. This steam contains about 70° of superheat and is at a pressure of 100-125 pounds. Steaming during solvent recovery generally lasts about 2 hours at a pressure of 60 pounds, although this will vary according to the economic conditions. When the recovery is complete, the pressure is released and the spent wood discharged. During the steaming process a regain of moisture occurs, so that the spent wood contains from 26 to 37% of water. The solvent recovery generally is greater than 99.5%.

In order to eliminate some of the variables in the course of the investigation and to provide a material which was known to pulp normally, jack pine *(Pinus banksiana)* was chosen as a standard material. To duplicate as far as possible the treatment given the commercially extracted wood, a normal jack pine log was chipped in the Carthage chipper and the chips further passed through a hammer shredder. The material was then divided into two parts; one portion was stored as unextracted chips, and the other portion was extracted with a petroleum naphtha solvent (boiling point range of 205°-238° F.) in a large extractor, after which the chips were removed and air dried. A material was thus obtained which was known to give a normal pulp, of a chip size comparable to the rootwood, and a portion of which had been solvent extracted and air dried.

The rootwood samples which were supplied by the Continental Turpentine and Rosin Corporation were of a small size and showed, on a screen analysis made with U. S. Standard sieve screens, the following chip size distribution:

Retained by No. 4	35%
Retained by No. 10	37%
Retained by No. 20	15%
Retained by No. 30	4%
Passing No. 30	9%

The wood was screened for all the cooks; the dust passing the No. 10-mesh screen was discarded because it would consume chemical and give a low yield of pulp.

Several of the cooks were made using a material called "the Uniform Chip"; this consisted of wood having a uniform chip size—viz., chips passing No. 4 and held on No. 10 screens. This size was chosen because in a commercial operation, by taking all the chips retained by the No. 10 screen, 72% of the available wood is utilized and the larger fraction can be broken down cheaply to the smaller size.

Experimental Procedures

The experimental work and its objectives can be divided into seven sections, as follows:

(1) Cooks were made on the unextracted and solvent-extracted jack pine. These were carried out to determine whether the small chip size and the solvent-extraction process were the causes of the poor yield.

(2) A series of cooks was run on the extracted rootwood, in which the cooking factors were varied over the commercial range in order to determine whether modification would give rise to fairly normal yields.

(3) Cooks were made on the unextracted rootwood to determine whether pulping of the wood prior to any extraction would give a normal yield. This included a cook using the alcohol-benzene extracted rootwood to study the effect of the extractives upon the mechanism of cooking.

(4) A cook was carried out on solvent-extracted rootwood using a weak alkali—viz., sodium carbonate. This was done to determine whether it would be possible to cook a degraded material with a weaker alkali and obtain a normal yield.

(5) Strength tests were made on representative pulps from the above cooks, and the results were compared with similar data for normal pulps.

(6) Chemical analyses were made of the unextracted and solvent-extracted rootwood to determine whether there were any obvious differences in composition between these two samples, and also to determine whether any constituents were present to which the low pulp yields could be attributed.

(7) Various physical and chemical tests were carried out on the woods and pulps. This was done to determine whether there were any significant differences between them and the usual data found for average wood and pulp samples.

To avoid confusion, the different woods are specifically defined in Table I, with the abbreviations used throughout this paper.

TABLE I.—WOODS USED IN EXPERIMENTAL WORK AND STANDARD ABBREVIATIONS

Wood	Abbreviation
Commercial southern pine rootwood	S.P.
Commercial solvent-extracted southern pine rootwood	S.P.-G.E.
Alcohol-benzene-extracted commercial southern pine rootwood	S.P.-A.B.E.
Alcohol-benzene-extracted commercial solvent-extracted southern pine rootwood	S.P.-G.A.B.E.
Jack pine	J.P.
Solvent-extracted jack pine	J.P.-G.E.
Alcohol-benzene-extracted jack pine	J.P.-A.B.E.
Alcohol-benzene-extracted and solvent-extracted jack pine	J.P.-G.A.B.E.
Uniform chip size	U.C.

Pulping Experiments

The first series of cooks was made on jack pine in order to study the effect of the small chip size in pulping a normal wood. The data on these cooks (2-5) are given in Table II. A cook was then carried out on the solvent-extracted jack pine, using the same pulping conditions to determine whether solvent extraction alone without steam treatment lowered the yield. The conditions for pulping this wood were then varied to study the effect of chemical concentration and length of time of cook on the yield. The results of these cooks (6-8) are also shown in Table II. It was found that the small size chips can be pulped to give a normal yield, and that the solvent extraction does not affect the yield from jack pine chips of the same size as solvent-extracted rootwood chips.

The next series of cooks (9-18) was made on solvent-extracted rootwood to determine whether modifications of the cooking factors would still give a low yield. In all cooks using the rootwood, the amounts of cooking chemical were calculated on the oven-dry wood, whereas the yields were calculated on the extractive-free basis to make them comparable with normal cooks. Hence, a yield calculated as 36% total yield would actually be 29% in the case of the solvent-extracted rootwood, and 23% in the case of the unextracted rootwood, because of the large amounts of extractives which are removed by the cooking liquor. The data for this series of cooks likewise are given in Table II. Cooks 20 and 21 were made with solvent-extracted rootwood "Uniform Chip," previously defined, to study the effect of chip size on the uniformity and degree of cooking.

Concurrent with the study of the cooking qualities of the wood, several other related factors were investigated. There was a possibility that the penetration of the cooking liquor was incomplete, thereby causing an overcooking of the outside portion of the chips without affecting the interior. The chips were immersed in the liquor under the desired conditions, the excess liquor drained off, and the chips split along the grain with a sharp knife. The red color produced by a drop of phenolphthalein indicator on the split surface showed the extent of penetration. Chips of various sizes were treated with a series of penetrating solutions, including cooking liquor, black liquor, and cooking liquor containing wetting agents. The results are given in Table III and show that, disregarding the largest chips, complete penetration is

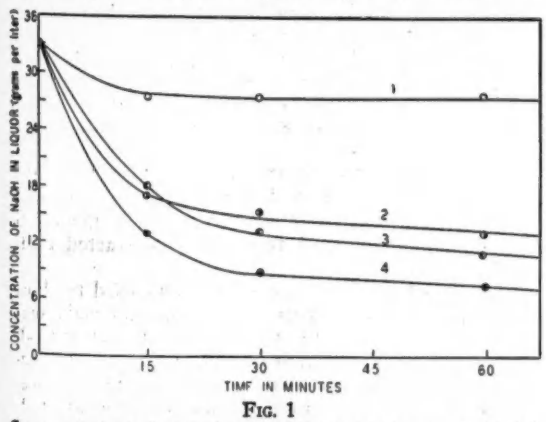

FIG. 1

Consumption of Sodium Hydroxide by Wood Constituents. 1. Alcohol-Benzene-Soluble Portion of Solvent-Extracted Rootwood. 2. Unextracted Jack Pine. 3. Solvent- and Alcohol-Benzene-Extracted Rootwood. 4. Solvent-Extracted Rootwood

TABLE II.—SUMMARY OF KRAFT COOKS MADE ON EXTRACTED AND UNEXTRACTED WOOD

All cooks were made with a chemical ratio of NaOH:Na₂S of 2:1 at a maximum temperature of 170° C. and a maximum pressure of 100 p.s.i.

Cook	Type of Wood	Weight of Wood, g.	Chemical, %	Liquor Ratio	Length of Cook, hr.	Total Yield, %	Screened Yield, %	Screenings, %
2	J.P.	695	27.6	6:1	4	45.5	43.9	1.9
3	J.P.	712	22.7	5.5:1	4	46.3	43.1	4.6
4	J.P.	706	20.0	5:1	4	...	...	...
5	J.P.	725	20.0	5:1	4	54.0	21.9	59.5
6	J.P.-G.E.	740	22.7	4.5:1	4	47.6	37.9	20.4
7	J.P.-G.E.	740	22.7	5.4:1	4.75	48.7	41.9	14.4
8	J.P.-G.E.	675	25.0	5:1	4	46.2	45.4	2.1
9	S.P.-G.E.	842	23.5	4.2:1	4.75	34.6	34.2	1.4
10	S.P.-G.E.	842	22.0	5:1	4	35.6	35.2	1.6
11	S.P.-G.E.	842	18.0	5:1	4	42.6	14.4	66.0
12	S.P.-G.E.	842	20.0	5:1	4	41.6	38.1	8.3
13	S.P.-G.E.	868	12.4	4.8:1	4	36.9	33.0	6.9
14	S.P.-G.E.	630	20.4	6.5:1	4	34.3	32.0	6.4
15	S.P.-G.E.	482	20.4	8.5:1	4	43.0	28.0	32.7
16	S.P.-G.E.	482	20.9	8.5:1	4	38.5	30.5	21.8
17	S.P.-G.E.	482	23.5	8.5:1	4	39.2	34.2	13.2
18	S.P.-G.E.	820	28.0	5:1	2.5	38.0	37.6	1.1
19	S.P.-G.E.U.C.	800	22.0	5:1	3	35.4	34.2	3.5
20	S.P.-G.E.U.C.	800	22.0	5:1	2.25	36.8	33.9	7.9
21	S.P.-A.B.E.U.C.	875	20.0	4.9:1	4	39.0	36.8	5.5
22	S.P.-U.C.	1110	26.0	3.8:1	4	34.8	34.3	1.5
23	S.P.-U.C.	1110	23.0	3.8:1	4	36.6	35.9	2.0
24	S.P.-G.E.	704	25.0*	5.3:1	8	...	...	...

* Cook 24 was made with sodium carbonate as the cooking chemical.

obtained under cooking conditions with normal cooking liquor. Black liquor is a very poor penetrating agent, and the commercial wetting agents employed were of no special value. In several cases where black liquor strengthened with 10% of cooking liquor was used, the cooking liquor penetrated faster and farther than did the black liquor.

Experiments were also carried out on the rate of alkali consumption for the solvent-extracted rootwood and its two components, the extractive-free wood, and the extractives removed with alcohol and benzene. According to the data shown in Fig. 1, the extractives consume only a small amount of alkali. The consumption curve for jack pine is also given for comparison. This work was carried out because there was an excessive alkali consumption in the solvent-extracted rootwood cooks, and it was possible that the extractives were consuming this material.

TABLE III.—PENETRATION EXPERIMENTS CARRIED OUT ON S.P.-G.E. CHIPS

Time, min.	Temperature, ° C.	Pressure, p.s.i.	Extent of Penetration
	Cooking Liquor—41 g./l. NaOH and Na₂S		
60	170	100	Excellent
30	170	100	Excellent
15	170	100	Fair
240	105	0	Excellent
2880	20	0	Poor
	Black Liquor		
60	170	100	Poor
30	170	100	Poor
15	170	100	Poor
240	105	0	Negligible
2880	20	0	Negligible
	Black Liquor and 10% of Cooking Liquor		
60	170	100	Fair
30	170	100	Poor
15	170	100	Poor
240	105	0	Very poor
2880	20	0	Very poor
	Cooking Liquor and 0.01% of Ultrawet		
60	170	100	Excellent
30	170	100	Excellent
15	170	100	Good
240	105	0	Fair
2880	20	0	Good
	Cooking Liquor and 0.1% of Aerosol		
60	170	100	Good
30	170	100	Good
15	170	100	Good
240	105	0	Poor
2880	20	0	Poor

Two cooks were also made on the original rootwood "Uniform Chips" to determine whether it is possible

to obtain a normal yield by pulping the unextracted wood. The data on these experiments are given in Table II (Cooks 22-23). It is obvious that the raw material is inferior even before processing.

Cook 21 was carried out on alcohol - benzene - extracted rootwood which was extracted to remove all of the extractives and was then air dried. An increase in yield was obtained over the rootwood cooks, showing that the extractives have a definite degrading effect on the mechanism of the cooking process and also verifying the fact that the extractives consume only a small amount of the alkali present.

Because it appeared impossible to obtained a normal yield of pulp from the solvent-extracted rootwood when normal pulping methods were employed, it appeared desirable to carry out an alkaline cook in which a weak alkali — viz., sodium carbonate — was used. This chemical does not have any extensive effect on a normal wood. The results are shown in Table II (Cook 24). Although the extractives were removed to a large extent, there was no apparent cooking action.

Strength Evaluations

In order to evaluate the pulps which were obtained in the various cooks, strength tests were made on representative pulps using the Lampén mill. Handsheets were prepared from the pulp at each freeness interval. The freeness was determined with the Schopper-Riegler freeness tester. The handsheets were dried and conditioned in the humidity room for at least 60 hours and were then tested for caliper, basis weight, bursting strength, and tearing strength.

The Lampén mill was used to evaluate the pulps because its action is reproducible and it requires only a small sample (24 grams). The results of these tests are given in Table IV, and typical curves are plotted in Fig. 2. These representative curves show the general trend, and the values for specific pulps may be found in the table.

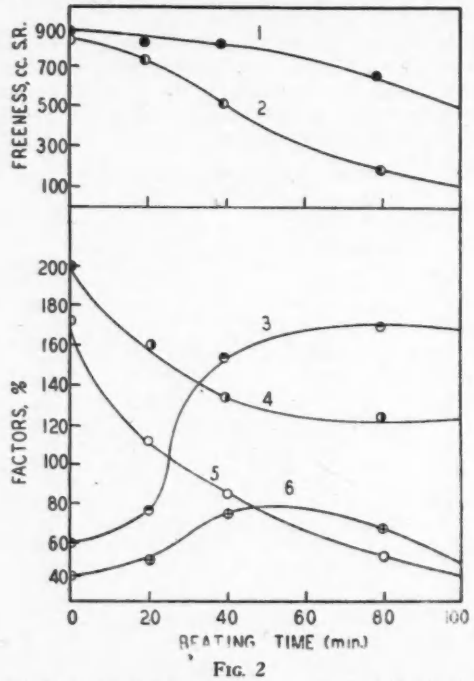

Fig. 2

Strength Properties of Rootwood Pulps. 1. Freeness Development of Jack Pine Pulp. 2. Freeness Development of Solvent-Extracted Rootwood. 3. Bursting Factor of Jack Pine Pulp. 4. Tear Factor of Jack Pine Pulp. 5. Tear Factor of Solvent-Extracted Pine Rootwood. 6. Burst Factor of Solvent-Extracted Pine Rootwood

Several interesting observations were made while evaluating the pulps. Most important was the fact that the rootwood pulps seem to hydrate very quickly and, when beaten for even a short period of time, break up into small fragments. After a period of 80 minutes in the Lampén mill, there is no apparent fibrous structure remaining, the pulp forming a mass of hydrated gel-like structures with a few macerated fibers floating suspended in the slurry.

Chemical and Physical Analyses

The poor yield and quality of the pulp obtained by cooking the rootwood appear to be due to some fundamental difference between the rootwood and normal wood. Chemical and physical tests were made, therefore, on the rootwood and the pulps obtained from it to discover any difference which might account for the poor pulping quality.

A complete chemical analysis was carried out on the rootwood and the solvent-extracted rootwood to determine whether analytical differences exist between these wood samples and normal wood, and also whether any change had occurred because of solvent extraction. The results of the analyses are found in Table V. Evidently the wood contains the usual constituents in normal amounts, and there is no evidence to account for the unsatisfactory behavior on pulping. All the analyses given represent the average of duplicate determinations.

TABLE IV.—PHYSICAL STRENGTH CHARACTERISTICS OF TYPICAL PULPS

Cook	Type of Wood	Burst Factor, %		Tear Factor, %		Freeness (S.-R.)[4]	
		Original[1]	Maximum[2]	Original[1]	Minimum[3]	Original[1]	Minimum[3]
3	J.P.	59	171	198	124	870	660
6	J.P.-G.E	67	151	142	107	865	595
7	J.P.-G.E.	66	153	177	115	850	560
8	J.P.-G.E.	82	143	163	105	820	540
12	S.P.-G.E.	43	69	178	84	850	250
18	S.P.-G.E.	45	63	172	53	850	180
20	S.P.-G.E.	44	61	158	67	850	210
21	S.P.-A.B.E.	52	96	260	127	840	230
23	S.P.	46	62	285	122	835	200

[1] Original refers to the factor obtained at zero beating time.
[2] Maximum refers to the maximum value reached by the pulp on beating.
[3] Minimum refers to the minimum value reached by the pulp on beating.
[4] Freeness determinations were made using the Schopper-Riegler instrument.

Since the chemical analyses threw little light on the problem, some further tests were carried out on the rootwood and solvent-extracted rootwood to investigate the poor pulping quality of the wood. A series of fiber measurements was made on the solvent-extracted rootwood pulp according to the methods of Graff *(7)*. The average fiber length was 1.88 mm. and the average width was 0.047 mm. These values show that the fibers are well within the size range of papermaking fibers.

Photomicrographs of the rootwood and of the solvent-extracted rootwood pulp fibers indicate that the solvent-extracted rootwood fiber is a little weaker than the fiber produced from the unextracted rootwood.

A series of tests which are generally used to show the extent of degradation of fibrous materials was made on the alcohol-benzene-extracted and the alcohol-benzene and solvent-extracted rootwood. Because only comparative values were obtained, corresponding tests were carried out on the alcohol-benzene-extracted and alcohol-benzene and solvent-extracted jack pine in order to provide a basis for

comparison. These tests included copper number and hot and cold 1% sodium hydroxide solubility. The cuprammonium viscosity of the holocellulose was also determined. The results are given in Table VI.

TABLE V.—CHEMICAL ANALYSIS OF SOLVENT-EXTRACTED AND UNEXTRACTED ROOTWOODS

Constituent	Wood Basis, %		Alcohol-Benzene and Hot-Water Extractive—Free Basis, %	
	S.P.	S.P.-G.E.	S.P.	S.P.-G.E.
Alcohol-benzene solubles	37.0	18.8	...	...
Carbon tetrachloride solubles	30.1	11.6	...	...
Gasoline solubles	22.3	5.9	...	...
Hot-water solubles	3.27	4.78	...	...
Ash	0.31	0.40	...	...
Holocellulose	41.2	53.6	68.9	70.4
Cross and Bevan cellulose	37.2	46.4	62.3	60.8
Alpha-cellulose	27.7	34.5	46.3	45.1
Lignin	19.3	26.7	32.27	34.90
Pentosans	3.8	4.35	6.4	5.7
Acetyl	0.27	0.34	0.46	0.45
Uronic acid anhydride	1.85	1.98	3.1	2.6

Note: All calculations were made on the moisture-free basis.

The copper numbers indicate that there are a larger number of aldehydic groups in the rootwood than are normally present in wood, and that this number increases during the commercial extraction process. The cuprammonium viscosity is a measure of the chain lengths of the cellulosic materials in the wood, and the values obtained indicate a normal viscosity for the rootwood. The viscosity of the solvent-extracted rootwood is considerably lower, however, and this is a definite proof that some type of degradation has taken place during the extraction process. The 1% alkali solubility can be a measure of the degradation in the wood, the presence of decay, or the amount of non-resistant hemicelluloses present. The results show that, although some degradation takes place during the extraction process, the raw material (cellulose in the rootwood) is very inferior.

To evaluate the pulp produced from the solvent-extracted rootwood, the copper number of Pulp 18 was compared with that of a normal southern kraft pulp. The copper number of the solvent-extracted rootwood pulp was 0.59 and that of the normal southern kraft 0.66. The pulp, therefore, is normal in this respect.

Some additional work was undertaken in an attempt to differentiate between the solvent-extracted rootwood pulp and a normal southern kraft using standard staining methods. Slides of both pulps were prepared and stained using C stain, A stain or modified Sutermeister stain, Bright stain, Herzberg stain, fuchsin, malachite green, and iodine stain. Both pulps were stained identically in all cases.

TABLE VI.—ANALYSIS OF PULPS AND WOODS
Tests Showing Degradation of the Fibrous Material

Type of Wood	Copper Number	Cuprammonium Viscosity on Holocellulose, centipoises	1% NaOH Solubility, %	
			Hot (100°C.)	Cold (20°C.)
S.P.-A.B.G.E.	5.17	31.3	20.8	6.25
S.P.-A.B.E.	4.27	52.0	15.4	4.37
J.P.-A.B.G.E.	1.81	...	9.6	1.25
J.P.-A.B.E.	1.76	50.1*	10.0	1.40

* Value reported by Hajny and Ritter *(9)*.

Swelling experiments were carried out using dilute cuprammonium hydroxide. It was thought that the extensive swelling and disintegration on beating might be due to the absence of the usual fiber membrane. Slides of solvent-extracted rootwood pulp and a normal southern kraft were prepared, and their behavior on treatment with solutions of different concentrations of TAPPI cuprammonium hydroxide was studied under the microscope. In all cases, the solvent-extracted rootwood fibers swelled faster and at more dilute concentrations, but the normal "ballooning" effect occurred. This showed that, although the solvent-extracted rootwood fiber is weaker, a fiber membrane or/and spiral wrapping is present.

For a further comparison of the pulps produced from jack pine, rootwood, and solvent-extracted rootwood, samples of each were beaten in the Lampén mill for 30 minutes; handsheets were then prepared, dried, and conditioned. These were tested for tensile strength, bulk, and opacity (contrast ratio). The results are found in Table VII. Although there is no significant difference in the bulk or opacity of the sheets, the tensile strength of the rootwood pulps is only about one-half that of the normal jack pine pulp.

TABLE VII.—COMPARISON OF NORMAL PULP WITH SOLVENT-EXTRACTED AND UNEXTRACTED ROOTWOOD PULPS

Pulp	Type of Wood	Bulk, cc./g.	Opacity (Contrast Ratio)	Tensile Strength, m.
3	J.P.	1.26	90	8270
18	S.P.-G.E.	1.22	87	4250
23	S.P.	1.24	86.3	4430

Conclusions

Solvent-extracted rootwood was cooked by the kraft process under conditions which were varied over the commercial range, and in no case was there obtained an economic yield over 37% based on the extractive-free material. The maximum yield only amounts to 30% when based on the moisture-free chips, because there was 19% of extractives in the wood.

Strength tests were made on representative pulps, and in all cases the maximum strength of the rootwood pulps was approximately 50% of that of normal jack pine kraft pulp.

The low yield of pulp obtained from solvent-extracted wood by the kraft process is not due to the small chip size necessary to procure maximum extraction efficiency, the solvent extraction process, or the steaming to which the extracted chips are subjected for the recovery of the solvent.

The low yield of the pulp obtained from solvent-extracted rootwood by the kraft process is mainly due to the fact that the wood used in the extraction process is very much degraded even before solvent extraction and, therefore, is not an economic raw material.

The solvent-extracted and unextracted rootwoods seem to be similar to normal wood in chemical composition. However, the degradation tests, such as cuprammonium viscosity, copper number, and alkali solubility, show that the cellulosic material is evidently degraded. Although the fibers are normal in size, their behavior on swelling, beating, etc. indicates that they are somewhat degraded.

The presence of extractives in the wood appears to cause a modification in the mechanism of cooking; woods containing large amounts of extractives gave lower yields of pulp with decreased strength properties, as compared with extractive-free wood.

The poor strength qualities obtained in the solvent-extracted rootwood pulps are not due to the small chip size necessary to preserve maximum extraction efficiency or to the solvent-extraction process. The steaming to which the extracted chips are subjected for the recovery of the solvent has a definite degrading effect. The main reason for the poor strength is the inherent inferior strength characteristics of the original rootwood.

In a normal kraft pulp the hydration characteristics are generally associated with strength develop-

ment. In the rootwood pulp, however, the fibers hydrate immediately upon contact with water but do not develop normal strength on beating.

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Hold Joint Meeting at Glens Falls

More than 150 members, guests and friends attended the joint fall meeting of the Superintendents Association and TAPPI at the Queensbury Hotel in Glens Falls, N. Y., September 24 and 25, 1943.

Friday morning was given over to registration and visits to Finch, Pruyn & Co. and International Paper Company mills and to the machine shops and foundry of The Sandy Hill Iron & Brass Works.

In the afternoon E. G. Amos, secretary of the Industrial Relations Committee of the American Paper and Pulp Association spoke on the labor problems confronting the pulp and paper industry stressing absenteeism and the manpower shortage. Mr. Amos' timely and well delivered talk stimulated a lively round table discussion.

While the men were attending the meeting the ladies went for a boat ride on Lake George to Paradise Bay as guests of the Sandy Hill Iron & Brass Works.

J. W. Youngchild, chairman, presided at the dinner Friday evening. After proposing toasts to the President and the King he welcomed those assembled to the meeting. Later Mayor John Bazinet of Glens Falls made a speech of welcome on behalf of the city.

On Saturday morning a nominating committee consisting of Ronald Hynes, C. E. Youngchild and John O'Brien offered the following slate of officers which were duly elected: Chairman, Herbert Karberg of the Alliance Paper Mills, Ltd., Merritton, Ontario; First Vice-Chairman Hilliard D. Cook of Sweet Brothers Manufacturing Company, Phoenix, N. Y.; Second Vice-Chairman, C. Ives Gehring of the Oswego Falls Corporation, Fulton, N. Y.; Third Vice-Chairman Jean Paul Rolland of the Rolland Paper Company, Ltd., St. Jerome, P. Q.; Secretary-Treasurer, Stephen Stapley of Provincial Paper, Ltd., Thorold, Ont.

After the business meeting Smith McLandress of the Appleton Wire Works of Appleton, Wis., gave an excellent paper on Fourdrinier Wires which was followed by a round table discussion.

A golf tournament was held at the Glens Falls Country Club and a bowling match at Miller Brothers alleys in the afternoon.

The prize winners of the golf tournament were C. E. Youngchild, R. M. Drummond, Kenneth Donahue, W. E. Bailey, John Rich, H. L. Mellen, G. W. Hill, M. M. MacLean, J. J. Lawson and P. W. Switzer.

The ladies had luncheon in the Hotel Lounge followed by a bridge tournament. The prize winners were Mrs. Thomas Rider, Mrs. Fletcher Thornton, Mrs. George Adams, Miss Katherine Smith, Mrs. R. I. Wynne-Roberts.

The banquet at 7:30 P.M. was attended by 150. J. W. Youngchild, the chairman, presided and introduced the newly elected officers. Mr. Smith McLandress introduced the speaker of the evening, Arthur G. Wakeman, Director of the Pulp and Paper Division of the War Production Board. Mr. Wakeman delivered a timely and forceful speech on the problems that confront the industry.

The golf prizes were then presented by C. E. Youngchild and R. M. Drummond. The ladies bridge prizes were presented by Mrs. F. P. Doane, Jr.

The floor of the ballroom was then cleared for dancnig which continued until 1:30 A.M. The music was furnished by Ray LaFarr's orchestra.

The following attended the meeting:

H. L. Joachim, Thomas R. Remsen, Herbert E. Karberg, E. G. Amos, G. W. Craigie, Harold B. Wells, Mr. and Mrs. Smith McLandress, Mr. and Mrs. P. D. Bradley, Sam Stevens, Mr. and Mrs. F. F. Dority, H. B. Todd, G. R. Hohn, James Derrico, George Duers, Frank Lang, A. B. Leachy, Mr. and Mrs. Walter Snyder, Mr. and Mrs. G. C. Walton, George E. Osterheldt, Homer Rice, George K. Walker, Mr. and Mrs. R. I. Wynne-Roberts, W. E. Bailey, Mr. and Mrs. T. E. Button, Mr. and Mrs. H. G. Morse, Mr. and Mrs. Peter D. Switzer, Milton J. McGuire, Henry L. Mellen, R. G. Batchelor, F. A. Dieckbrader.

Tom Trimble, J. M. Booth, William Greeley, A. S. Hyeslip, Wallace Buck, W. C. Cooper, J. K. Donahue, George S. Knapp, Thomas LaHaise, H. B. McGee, Mr. and Mrs. George J. Adams, O. B. Beyer, Mr. and Mrs. H. P. Bailey, Mr. and Mrs. A. B. Copping, Mr. and Mrs. Robert Drummond, Howard Dyke, Mr. and Mrs. F. J. McCourt, Jr., Mr. and Mrs. J. W. Youngchild, Mr. and Mrs. C. E. Youngchild, Carl Krancher, Barry Turner, Mr. and Mrs. Ermund Noonan, M. Jacobs, Mr. and Mrs. Henry Fales, M. B. Gormley, M. C. MacLean, E. P. McGinn, Mr. and Mrs. Lawrence Sherman, Mr. and Mrs. R. W. Hynes, John Rich, Mr. and Mrs. A. M. Ross, Prof. W. O. Hisey, W. O'Brien, Mr. and Mrs. Norman Scott, C. Ives Gehring, George W. Hill, J. J. O'Brien, Stephen G. Stapley, William E. Wanstall, J. O. Ross, Lyman Beeman, Lawrence Thompson,

Mr. and Mrs. Foster P. Doane, Jr., Mr. and Mrs. J. W. Joslyn, Frank A. Juckett, Philip J. Riley, Mr. and Mrs. Ernest Waters, George S. Witham, Paul Carlson, Howard West, Mrs. Peter Abel, Mr. and Mrs. Fletcher P. Thornton, K. P. Coachman, J. J. Williams, Mr. and Mrs. Roger Trimbey, Ray Smith, Elmer R. Thomas, Jr., Arthur C. Gault, T. M. Avery, Richard Duell, Mr. and Mrs. C. J. McIntire, Mr. and Mrs. P. Fay Marrs, L. Pfister, L. J. Peck, Arthur Wakeman, Edward A. Murphy, George E. Pratt, Mr. and Mrs. Thomas Rider, Mr. and Mrs. E. H. Conway, F. M. Williams, Thomas A. Gastonguay.

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You are invited to use Our Technical Service on

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GUMS
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FOR ENZYME CONVERSION

AMIJEL
FOR THE BEATERS

LAM-O-DEX
FOR LAMINATING

CORAGUM
FOR CORRUGATING

WRITE...

Corn Products Sales Co.
17 BATTERY PLACE
NEW YORK CITY

YES PAPER MAKING HAS COME A LONG WAY SINCE 1830

Then mass production of paper was only an idea subscribed to by a very few but none of whom has applied it to manufacture. As inventive genius came to be applied, the workshop became a factory, progressing thereafter until tons of paper were produced faster than sheets. Production machines replaced the artist's tools. Even the felt layers used to remove water from the sheets were replaced by production felts. Progress in felt making has paralleled progress in paper making. Since 1890 Appleton Felts have met all requirements of paper mill production—today preferred by mills everywhere.

This advertisement is a continuation of a series started in 1940 depicting early history of paper making.

APPLETON WOOLEN MILLS. APPLETON. WIS

New York Paper and Pulp Market Review

Paper Demand Continues Strong For Major Types—Government To Cut Use of Printing Paper 25% This Fiscal Year—Drive To Cut More Pulpwood Is Progressing—Waste Paper Market Is Strong.

Office of the PAPER TRADE JOURNAL
Wednesday, October 6, 1943.

Backlog orders continue upward in trend under a rising demand, stimulated by prospects of a short supply in major types of paper and unfavorable reports of a decline in the supply of pulpwood. Prospects for the future at this date indicate a rather tight paper market so far as civilian requirements are concerned. Report that the government will economize in its use of printing papers by reducing use 25%, is encouraging news. Reports from several quarters indicate that substantial savings are possible and practicable in many divisions of the federal government, 5,000 tons of paper by the WPB, etc., and the elimination of many unnecessary uses in practically all departments at Washington.

The index of general business activity for the week ended September 25 declined to 138.6, from 139.4 for the previous week, compared with 130.2 for the corresponding week last year. The index of paper board production was 138.7, compared with 144.5 for the previous week, and with 119.9 for the corresponding week last year.

Paper production for the week ended September 25 was estimated at 92.1%, compared with 87.2% for 1942, with 105.2% for 1941, with 86.7% for 1940, and with 95.7% for the corresponding week for 1939.

Paper board production for the week ended September 25 was 96.0%, compared with 78.0% for 1942, with 98.0% for 1941, with 78.0% for 1940, and with 82.0% for the corresponding week for 1939.

The Office of War Information on October 1 stated that Federal savings reflected in orders to the Government Printing Office are estimated at approximately 25% of paper consumed yearly. This is estimated to result in a saving of 7,800,000 pounds of printing papers and approximately 182,000,000 pounds of chemical wood pulp during the fiscal year 1943. Writing paper mills, the report states, indicate a 24% reduction in government orders from August 14 to September 4.

Wood Pulp

Some improvement in the future supply of pulpwood is reported as the campaign to cut more pulpwood is progressing well. According to a statement of R. J. Cullen, chairman of the International Paper Company, on September 29, International mills in the south are short 390,000 cords of pulpwood on an annual basis, and inventories are short 215,000 cords. The eight southern mills of the company, he stated, have an annual capacity of 2,600,000 cords of pulpwood.

Rags

Demand for new cotton cuttings continues active. Major interest still centers in the colored grades which are at full ceiling prices. Demand for white cuttings is moderate, with prices slightly under ceiling quotations.

Mill buying of roofing rags is active and all supplies are readily taken at ceiling prices. Current demand for all grades of old cotton rags is active and prices are firm.

Old Rope and Bagging

No important change in prices or demand for old rope has been reported this week. Quotations are firm. The supply situation is tight on most hard fiber twines.

Trading in scrap bagging has declined currently to reach the lowest level in years. Prices are nominal.

Old Waste Paper

Mill buying of waste paper continues heavy. The OPA on September 29 amended the classification of No. 1 heavy book stock, to "Repacked No. 1 heavy book stock." This pack may now contain up to 20% of the total shipment by weight, magazines of fine groundwood. Pulp magazines and other publications containing coarse groundwood must not be included.

Twine

Demand for twine continues active. No important change in prices or other maret factor has been reported this week. Government requirements for most hard fiber twine continues very heavy.

V. S. Denison Dead

V. S. Denison, known from coast to coast as an expert on paper machines and their erection, died in Sandusky, Ohio, on September 30 after a long illness.

Mr. Denison was born at Connersville, Ind., January 4, 1884. He started work with the Connersville Blower Company and then went with Sandusky Foundry and Machine Company as sales engineer. In 1929 he went with the Beloit Iron Works of Beloit, Wis., and has been with that company ever since. He was chairman of the Allied Industrial Affiliates of the American Pulp and Paper Mill Superintendents Association in 1942 and was a member of the Technical Association of the Pulp and Paper Industry.

Mr. Denison is survived by his widow, three daughters, Mrs. Morris of Alliance, Ohio; Mrs. Thomas of Sandusky, Ohio; Miss Ruth Denison, a son, Robert, and five grandchildren.

Waterproof Group Presents Petition

Philip Deitsch, managing director of the Waterproof Paper Group, 19 West 44th street, New York, on Wednesday of this week presented a petition before the War Manpower Commission in Washington asking for immediate and prompt relief in the critical manpower situation which the waterproof paper industry now faces as a result of local draft board action. This action, the petition states, has repleted the manpower resources of the industry to the point where production of vitally needed waterproof papers as materials of war is placed in definite jeopardy.

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PARIS
BLACKS

Carbon blacks with a high degree of miscibility especially adapted to the needs of the paper industry. Supplied uncompressed, semi-compressed or in bead form.

BLAC-KING 45 RX

An aqueous dispersion of Carbon Black with a solid content of 45%. Especially designed for use as a coloring agent for paper. Clean to handle and eliminates contamination of other colors in the beater room.

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FLAMEPROOFING AGENTS, WATERPROOFING AGENTS, AND OTHER SPECIALTIES FOR THE PAPER INDUSTRY.

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Write for our catalogue, "CHEMICALS BY GLYCO."

GLYCO PRODUCTS CO., Inc.

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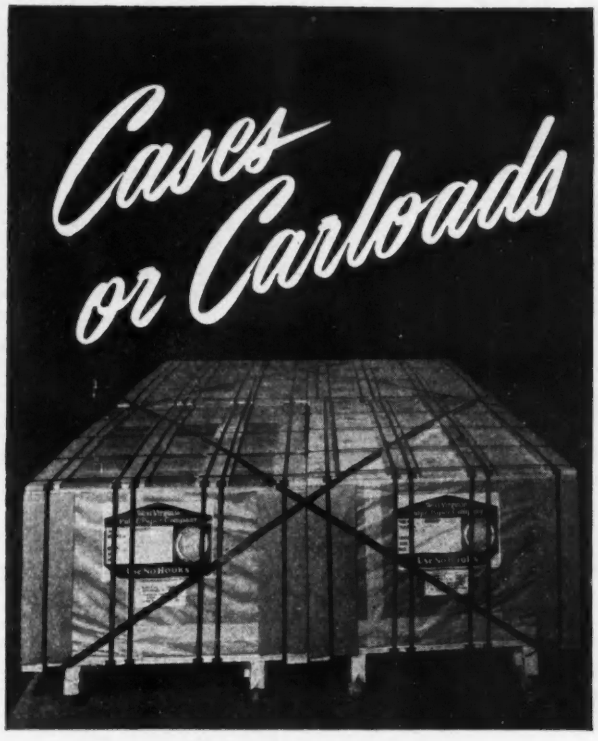

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better protection

All sizes of shipments — from the smallest cases or cartons to full cars — can have the advantages of Stanley Steel Strapping and Car Banding materials and methods.

Reducing shipping room man hours is only one advantage of the Stanley System. It gives shipments better protection against the punishing treatment so often met on today's overworked carriers. It also saves valuable shipping space without sacrifice of strength.

The Stanley Steel Strapping System includes tools, reels, and accessories for every purpose,— everything you need for fast, dependable application. Write for details. The Stanley Works, Steel Strapping Division, New Britain, Connecticut.

1843 STANLEY 1943

STANLEY
STEEL STRAPPING AND CAR BANDING SYSTEMS

MISCELLANEOUS MARKETS

Office of the PAPER TRADE JOURNAL.
Wednesday, October 6, 1943.

BLANC FIXE—The market for blanc fixe continues to conform to prevailing prices. Demand is reported fair. The pulp is currently quoted at $40 per ton, in barrels, at works; the powder is currently quoted at $60 per ton, f.o.b. works.

BLEACHING POWDER—Current demand is reported active. Prices continue unchanged. Bleaching powder is currently quoted at from $2.50 to $3.10 per 100 pounds. All prices in car lots, in drums, f.o.b. works.

CASEIN—OPA maximum prices on processed acid-precipitated casein are as follows: 10,000 pounds or more, 24 cents per pound; 2,000 pounds, 24¼ cents per pound; less than 2,000 pounds, 24¾ cents per pound, f.o.b. shipping point.

CAUSTIC SODA—Supply situation still tight, as demand for dry caustic soda is reported in excess of production. Prices continue unchanged. Solid caustic soda is currently quoted at $2.30 per 100 pounds. The flake and ground are currently quoted at $2.70 per 100 pounds. All prices in car lots, in drums, f.o.b. works.

CHINA CLAY—Demand for some grades of china clay is reported fair to moderately good. Domestic filler clay is currently quoted at from $7.50 to $15 per ton; coating clay is quoted at from $12 to $22 per ton, at mines. Imported china clay is currently quoted at from $13 to $25 per long ton, ship side.

CHLORINE—Demand for chlorine is reported strong, with the supply situation more satisfactory at this date. Prices continue unchanged. Chlorine is currently quoted at $1.75 per 100 pounds, in single-unit tank cars, f.o.b. works.

ROSIN—Higher prices are quoted on some grades of rosin this week. "G" gum rosin is currently quoted at $3.97 per 100 pounds, in barrels, Savannah. "FF" wood rosin is currently quoted at $3.94 per 100 pounds, in barrels, New York. Seventy per cent gum rosin is currently offered at $4.16 per 100 pounds, f.o.b. works.

SALT CAKE—Quotations on salt cake continue to be reported unchanged. Demand continues moderate. Domestic salt cake is currently quoted at $15 per ton, in bulk. Chrome cake is currently quoted at $16 per ton. All prices in car lots, f.o.b. shipping point.

SODA ASH—Demand for soda ash continues to be reported as active. Prices continue to conform to prevailing quotations. Prices on soda ash in car lots, per 100 pounds, are as follows: in bulk, $.90; in paper bags, $1.05; and in barrels, $1.35.

STARCH—More corn coming into the cash market but market is still reported tight. Quotations continue unchanged. Pearl is currently quoted at $3.10 per 100 pounds. The powdered grade is currently quoted at $3.20 per 100 pounds. All prices in car lots, in bags, f.o.b. Chicago.

SULPHATE OF ALUMINA—The supply situation in sulphate of alumina is reported satisfactory at this date. Quotations continue unchanged. Prices on the commercial grades are quoted at from $1.15 to $1.25 per 100 pounds. The iron free is currently quoted at $2.35 per 100 pounds. All prices in car lots, in bags, f.o.b. works.

SULPHUR—Demand is reported active for sulphur. Quotations on all grades continue unchanged. Annual contracts are currently quoted at $16 per long ton, f.o.b. mines. The current contract price at Gulf Ports remains unchanged at $17.50 per long ton.

TALC—Demand is reported moderate to good on some grades of domestic talc at this date. The domestic grades are currently quoted at from $16 to $21 per ton, at mines.

MARKET QUOTATIONS

All market quotations, excepting those otherwise designated as official OPA maximum prices, are based on the manufacturers' price level as of October 1-15, 1941; maximum wholesale prices are based on the merchants' maximum prices for stipulated quantities at a quoted price to all customers of a like class, as shown by the merchant's sales records of goods delivered during March, 1942. A merchant's price list in effect in March 1942, showing quotations of actual shipments, will establish the current maximum prices.

Paper

(Delivered New York)

News, per ton—			
Roll, contract	*$58.00	@	—
Sheets	64.00	"	—
* OPA Maximum Price.			
Kraft—per cwt.—Carload Quantities Zone A, f.o.b. Mill			
Superstandard Wrapping	*$5.25	@	—
No. 1 Wrapping	*5.00	"	—
Standard Wrapping	*4.75	"	—
Standard Bag	*4.375	"	—
* OPA Manufacturers' Prices.			
Tissues—Per Ream—Carlots			
White No. 1	1.12½	"	—
White No. 1 M. G.	1.10	"	—
White No. 1½	1.00	"	—
White No. 2	.90	"	—
Anti-Tarnish M.F.	1.20	"	—
Colored	—	"	—
Kraft	.95	"	—
Manila	.90	"	—
Toilet—1 M. Sheets—Per Case			
Unbleached	4.25	"	—
Bleached	5.70	"	—
Unbl. Toilet, 1 M.	4.16	"	—
Bleached Toilet	5.70	"	—
Paper Towels, Per Case—			
Unbleached, Jr.	2.60	"	—
Bleached, Jr.	3.20	"	—
Manila—per cwt.—C. l. f. a.			
No. 1 Jute	11.25	@	—
No. 1 Manila Wrapping, 35 lb.	6.00	"	6.25
No. 2 Manila Wrapping, 35 lb.	5.75	"	6.00
Boards, per ton—			
News	*48.00	@	—
Chip	*45.00	"	—
Sgl. Mla. Ll. Chip	*60.00	"	—
White Pat. Coated	*75.00	"	—
Kraft Liners 50 lb.	*63.00	"	—
Binders Boards	84.00	"	116.00

* OPA Base Prices per 10 tons. Less than 10 tons but over 3 tons, add $2.50; three tons or less, add $5; regular 35-39 basis, add $5.; basis 40-49, add $2.50; basis 91-100, add $2.50; basis 101-120, add $5.

The following are representative of distributors' resale prices:

Rag Content Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds		Ledgers	
100% Rag Ext. No. 1	$39.10	@$46.00	$40.25	@$47.25
100% Rag	32.20	" 37.75	33.35	" 39.25
85% Rag	....	"	29.90	" 35.00
75% Rag	23.00	" 27.00	24.15	" 28.25
65% Rag	....	"	22.80	" 27.75
50% Rag	18.70	" 22.75	19.90	" 24.25
25% Rag	16.40	" 20.00	17.55	" 21.50

Colors at $1.00 cwt. extra.

Sulphite Bonds and Ledgers—White, Assorted Items. Delivered in Zone 1:

	Bonds		Ledgers	
No. 1	$10.55	@$12.75	$11.70	@$14.25
No. 2	9.65	" 11.75	10.80	" 13.25
No. 3	9.20	" 11.25	10.35	" 12.50
No. 4	8.90	" 10.75	10.05	" 12.25

Colors $1.00 cwt. extra.

Free Sheet Book Papers—White, Cased Paper, Delivered in Zone 1:

No. 1 Glossy Coated	$13.65	@	$13.50
No. 2 Glossy Coated	12.40	"	14.00
No. 3 Glossy Coated	11.60	"	13.25
No. 4 Glossy Coated	11.15	"	12.75
No. 1 Antique (watermarked)	10.25	"	11.75
No. 2 Offset	9.60	"	11.00
A Grade E. F.	9.35	"	10.75
A Grade S. & S. C.	9.60	"	11.00
B Grade E. F.	8.85	"	10.25
B Grade S. & S. C.	9.10	"	10.50
C Grade E. F.	8.55	"	9.75
C Grade S. & S. C.	8.80	"	10.00
D Grade E. F.	8.25	"	9.50
D Grade S. & S. C.	8.50	"	9.75
Ivory & India at $.50 cwt. extra.			

Wood Pulp

OPA Maximum Prices and Canadian Manufacturers Prices, Less Freight, Not Exceeding OPA Allowances.

Bl. Softwood Sulphite	$76.00		
Unbl. Softwood Sulphite	65.00	@	66.00
Bl. Hardwood Sulphite	73.50		
Unbl. Hardwood Sulphite	63.50		
Bl. Mitscherlich	81.00		
Unbl. Mitscherlich	72.00	@	82.00
N. Bleached Sulphate	86.00		
S. Bleached Sulphate	79.00		
N. Semi-Bleached Sulphate	82.00		
S. Semi-Bleached Sulphate	75.00		
N. Unbl. Sulphate	73.00		
S. Unbl. Sulphate	63.50		
Bl. Soda	66.00		
Unbl. Soda	62.00		
Groundwood	46.00		

Transportation Allowances Applying to Producers of Wet Wood Pulp.

	Below 50% Air Dry Weight
Northeast	$13.50
Lake Central	13.50
Southern	16.00
West Coast (in area)	10.50
West Coast (out area)	16.50

	50%-80% Air Dry Weight
Northeast	$11.50
Lake Central	11.50
Southern	14.00
West Coast (in area)	9.50
West Coast (out area)	15.50

Applying to Producers of Dry Wood Pulp.

	Above 80% Air Dry Weight
Northeast	$8.50
Lake Central	8.50
Southern	11.00
West Coast (in area)	7.50
West Coast (out area)	13.50

Should freight charges actually exceed these allowances, the difference may be added to the maximum prices.

Domestic Rags

New Rags (Prices to Mill f. o. b. N. Y.)

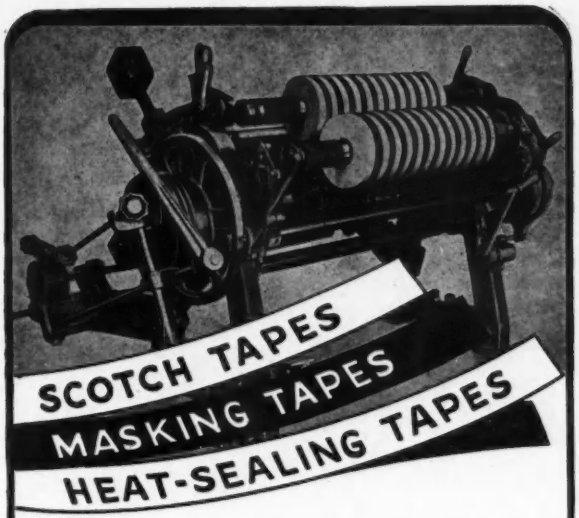
Shirt Cuttings—			
New White, No. 1	6.50	@	7.25*
Silesias No. 1	—	"	5.75*
New Unbleached	6.75	"	7.50*
Blue Overall	—	"	5.50*
Fancy	—	"	3.50*
Washables	—	"	3.00*
Bleached Khaki Cuttings	—	"	4.25*
Unbleached Khaki Cuttings	—	"	3.50*

* OPA Maximum Prices.

UNION EQUIPMENT

We can still supply information and help in maintaining your *Union* equipment. We are sorry, but we can't supply you with new installations. If it is a matter of keeping present machines running, we will be glad to do all we can.

UNION MACHINE COMPANY
FITCHBURG, MASS.
(Associated with Union Screen Plate Company)



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All three of the tapes mentioned above are finding increasing applications in war industries and Camachine 26-3, as illustrated, is the ideal slitting and roll winding machine for producing rolls of these tapes with clean cut edges.—Judged by such standards as speed, economy and convenience of operation, quantity and quality of finished rolls converted, also low maintenance cost, Camachine 26-3 is unsurpassed for this job. *Write for folder.*

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CAMACHINE 26-3

PRICE & PIERCE »»»»»»»ltd•

Wood Pulp & Paper Agents

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West Virginia Pulp and Paper Company

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35 East Wacker Drive
Chicago

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ENGLISH FINISH SUPERCALENDERED
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Offset, Envelope, Bond, Writing, Mimeograph, Ledger, Eggshell, Cover and Music Papers, Index Bristol, Post Card and Label Papers

HIGH GRADE COATED BOOK

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KRAFT WRAPPING AND KRAFT ENVELOPE
KRAFT LINER BOARD
BLEACHED SULPHITE AND SODA PULP
BLEACHED AND UNBLEACHED KRAFT PULP

MILLS:

Mechanicville, New York
Luke, Maryland
Covington, Virginia
Tyrone, Pennsylvania
Williamsburg, Pennsylvania
Charleston, South Carolina

Old Rags

White, No. 1—			
Repacked	*3.80	"	—
Miscellaneous	*3.20	"	—
White, No. 2—			
Repacked	*2.90	"	—
Miscellaneous	*2.65	"	—
Third and Blues—			
Repacked	*2.20	"	—
Miscellaneous	*1.80	"	—
Roofing Rags—			
No. 1	*1.55	"	—
No. 2	*1.45	"	—
No. 3 (bagging)	*1.35	"	—
No. 4	*1.35	"	—
No. 5A	*1.35	"	—
Old Manila Rope	5.75	"	—

OPA Maximum Prices.

Foreign Rags

All Prices nominal

New Rags			
New Dark Cuttings	2.25	@	2.40
New Mixed Cuttings	2.00	"	2.20
New Light Silesias	5.50	"	5.75
Light Flannelettes	5.50	"	5.75
New White Cuttings	7.00	"	7.50
New Light Oxfords	4.00	"	4.50
New Light Prints	3.00	"	3.25
Old Rags			
No. 1 White Linens	7.50	"	8.50
No. 2 White Linens	6.50	"	7.50
No. 3 White Linens	4.50	"	—
No. 4 White Linens	2.25	"	3.25
No. 1 White Cotton	4.25	"	4.75
No. 2 White Cotton	3.25	"	3.75
No. 3 White Cotton	2.50	"	3.00
No. 4 White Cotton	1.90	"	2.20
Extra Light Prints	2.00	"	2.40
Ord. Light Prints	1.75	"	2.15
Med. Light Prints	1.55	"	1.95
Dutch Blue Cottons	2.25	"	2.50
French Blue Linens	3.00	"	—
Cheeks and Blues	2.00	"	—
Linsey Garments	1.90	"	2.00
Dark Cottons	1.50	"	1.60
Old Shopperies	1.30	"	1.45
New Shopperies	1.45	"	1.50
French Blues	2.25	"	2.50

BAGGING

(Prices to Mill, f. o. b. N. Y.)

Gunny No. 1—			
Foreign	Nominal		
Domestic	4.25	@	4.35
Wool Tares, light	4.25	"	4.50
Wool Tares heavy	4.50	"	5.00
Bright Bagging	4.50	"	4.85
Manila Rope—			
Foreign	—	"	—
Domestic	*5.75	"	—
Jute Threads	5.50	"	—
No. 1 Sisal Strings	*4.00	"	—
Mixed Strings	2.00	"	—

* OPA Maximum Price.

Old Waste Papers

(F. o. b. New York)

OPA Maximum Prices

No. 1 Hard White Envelope Cuts, one cut	3.37½	@	—
No. 1 Hard White Envelope Cuts	3.12½	"	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
No. 1 Hard White Shavings, ruled	2.50	"	—
Soft White Shavings, one cut	2.87½	"	—
No. 1 Soft White Shavings	2.50	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Mixed Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
Mixed Groundwood Colored Shavings	.90	"	—
Overissue Magazines	1.67½	"	—
No. 1 Heavy Books & Magazines	1.67½	"	—
Mixed Books	.85	"	—
No. 1 White Ledger	2.17½	"	—
No. 2 Mixed Ledger, colored	1.87½	"	—
New Manila Envelope Cuttings, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
Extra Manilas	1.85	"	—
Mixed Kraft, Env. & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
Triple Sorted, No. 1 Brown Soft Kraft	2.50	"	—
New 100% Kraft Corrugated Cuttings	2.25	"	—
No. 1 Assorted Old Kraft	1.75	"	—
New Jute Corrugated Cuttings	.90	"	—
Old 100% Kraft Corrugated Containers	1.75	"	—
Old Corrugated Containers	1.15	"	—
Box Board Cuttings	.72½	"	—
White Blank News	1.65	"	—
Overissue News	.85	"	—
No. 1 News	.75	"	—
No. 1 Mixed Paper	.70	"	—
Old Corrugated Containers	.82½	"	—
Mill Wrappers	.85	"	—

Twines

(F. o. b. Mill)

(Soft Fiber)

Coarse Polished—			
India	.21	@	—
White Hemp	.21	"	—
Fine Polished—			
Fine India	.26	"	—
Unpolished—			
Box	.17½	"	—
Paper Makers	.17	"	—
Tube Rope	.19	"	—
Wall Paper	.20½	"	—
Wrapping	.23	"	—
Soft Fiber Rope	.19	"	—
Cotton	.25	"	—
(Hard Fiber)			
Medium Java	.18	"	—
Mex. Sisal	.16	"	—
Manila		"	—

PHILADELPHIA

Domestic Rags (New)

(Price to Mill, f. o. b. Phila.)

Shirt Cuttings—			
New White No. 1	.07½	@	.07½
New White No. 2	.04½	"	.05
Light Silesias	.04½	"	.04¾
Silesias, No. 1	.04	"	.04¼
Black Silesias, soft	.03¾	"	.04
New Unbleached	.07¼	"	.07½
Washable Prints	.03¾	"	.03½
Washable No. 1	.02	"	.02¼
Blue Overall	.04½	"	.05½
Cottons—According to grades—			
Washable shredding	—	"	.01¾
Fancy Percales	.03¾	"	.03½
New Black Soft	.02¾	"	.03
New Dark Seconds	1.75	"	2.00
Khaki Cuttings—			
No. 1 O. D.	.03	"	.03¼
No. 2 Mixed	.02¼	"	.02½
Corduroy	.01¾	"	.02¼
New Canvas	.04¾	"	.05¼
New Black Mixed	—	"	.02½

Domestic Rags (Old)

White No. 1 — Repacked	3.80	"	—
White No. 2 — Repacked	2.90	"	—
Miscellaneous No. 1	3.20	"	—
Miscellaneous No. 2	2.65	"	—
Thirds and Blues—			
Miscellaneous	1.80	"	—
Repacked	2.20	"	—
Black Stockings— (Export)	Nominal		
Roofing Stock—			
Foreign No. 1	Nominal		
Domestic No. 1	1.55	"	—
Domestic No. 2	1.45	"	—
Roofing Bagging	1.35	"	—
Old Manila Rope	5.75	"	—

Bagging

(F. o. b. Phila.)

Gunny No. 1—			
Foreign	Nominal		
Domestic	3.00	"	3.50
Sisal Rope	3.75	"	—
Mixed	1.00	"	1.50
Scrap—			
No. 1	3.25	"	3.50
No. 2	1.75	"	1.80
Wool Tares, heavy	4.00	"	4.25
No. 1 New Lagg Burlap	3.00	"	4.00
New Burlap Cuttings	3.75	"	4.00

Old Papers

(F. o. b. Phila)

OPA Maximum Prices

No. 1 Hard White Envelope Cuts, one cut	3.37½	"	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
Soft White Shavings, one cut	2.50	"	—
White Blank News	1.65	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 White Ledger	2.17½	"	—
No. 2 Ledger, colored	1.87½	"	—
No. 1 Heavy Books & Magazines	1.67½	"	—
Overissue Magazines	1.67½	"	—
New Manila Envelope Cuttings	2.65	"	—
No. 1 Assorted Old Kraft	1.75	"	—
No. 1 Mixed Paper	.70	"	—
Box Board Cuttings	.72½	"	—
Kraft Corrugated Cuttings	2.25	"	—
Old Corrugated Containers	1.15	"	—
Overissue News	.85	"	—
No. 1 News	1.00	"	—

BOSTON

Old Papers

(F. o. b. Boston)

OPA Maximum Prices

No. 1 Hard White Shavings, unruled	2.87½	@	—
No. 1 Hard White Shavings, ruled	2.50	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
New Manila Envelope Cuts, one cut	2.87½	"	—
Hard White Envelope Cuts, one cut	3.37½	"	—
Triple Sorted No. 1 Brown Soft Kraft	2.50	"	—
Mixed Kraft Env. & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
No. 1 Heavy Books & Magazines	1.67½	"	—
New Manila Envelope Cuts, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
White Blank News	1.65	"	—
No. 1 Assorted Old Kraft	1.75	"	—
No. 1 Mixed Paper	.70	"	—
Overissue News	.85	"	—
Box Board Cuttings	.72½	"	—
New Corrugated Cuttings, Kraft	2.25	"	—
Old 100% Kraft Corrugated Containers	1.75	"	—
Old Corrugated Containers	1.15	"	—
Jute Corrugated Cuttings	1.07½	"	—

Bagging

(F. o. b. Boston)

Gunny Bagging—			
Foreign	(nominal)		
Domestic	—	"	3.50
Sisal Rope No. 1	*4.75	"	—
Sisal Rope No. 2	*4.25	"	—
Mixed Rope	1.35	"	1.50
Transmission Rope—			
Foreign	(nominal)		
Domestic	2.75	"	3.00
Manila Rope—			
Foreign	(nominal)		
Domestic	5.75	"	—
Soft Jute Rope	4.50	"	5.00
Jute Carpet Threads	3.00	"	3.50
Bleachery Burlap	8.50	"	9.00
Scrap Burlap—			
Foreign	(nominal)		
Domestic	—	"	3.50
Wool Tares—			
Foreign	(nominal)		
Domestic	4.25	"	—
Aust. Wool Pouches	4.65	"	4.87½
New Burlap Cuttings	4.75	"	5.00
Heavy Baling Bagging	4.00	"	4.25
Paper Mill Bagging	2.50	"	3.00
No. 2 Bagging	1.35	"	—

* OPA Maximum Price.

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints	.04½	@	.04½
Fancy Percales	.04¼	"	.05
New White No 1	.06¾	"	.07
New Light Flannelettes	.05½	"	.06
Canton Flannels, Bleached	.06	"	.06½
Underwear Cutters, Bleached	.06	"	.06½
Underwear Cutters, Unbleached	.06¼	"	.06½
Silesias No. 1	.05¾	"	.06
New Black Silesias	.06	"	.06½
Red Cotton Cuttings	.03½	"	.03¾
Soft Unbleached	.04	"	.04
Blue Cheviots	.06½	"	.06½
Fancy	.05½	"	.06
Washable	.02¼	"	—
Khaki Cuttings	.02¼	"	—
O. D. Khaki	.02¾	"	.03
Corduroy	.03½	"	.03½
New Canvas	.03¼	"	.03¾
B. V. D. Cuttings	.06½	"	.06¾
	.06¼	"	.06¾

Domestic Rags (Old)

(F. o. b. Boston)

White No. 1—			
Repacked	3.80	@	—
Miscellaneous	3.20	"	—
White No. 2—			
Miscellaneous	2.65	"	—
Twos and Blues, Repacked	2.20	"	—
Old Blue Overalls	2.25	"	2.50
Thirds and Blues, Repacked	2.20	"	—
Miscellaneous	1.80	"	—
Black Stockings	3.50	"	4.00
Roofing Stock—			
No. 1	1.55	"	—
No. 2	1.45	"	—
No. 3	1.35	"	—
No. 4	1.35	"	—
No. 5, Quality A	1.35	"	—
Quality B	1.20	"	—
Quality C	.95	"	—
Old Manila Rope	5.75	"	—

* OPA Maximum Prices.

Foreign Rags

(F. o. b Boston)

Canvas	(nominal)
Dark Cottons	(nominal)
Dutch Blues	(nominal)
New Checks and Blues	(nominal)
Old Fustians	(nominal)
Old Linsey Garments	(nominal)
New Silesias	(nominal)

CHICAGO

Waste Paper

(F. o. b. Chicago)

OPA Maximum Prices.

Shavings—			
No. 1 Hard White Envelope Cuts, one cut	3.37½	"	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
No. 1 Soft White Shavings	2.50	"	—
No. 1 White Ledger	2.17½	"	—
No. 1 Heavy Books & Magazines	1.67½	"	—
White Blank News	1.65	"	—
Mixed Kraft Env. & Bag Cuttings	2.75	"	—
No. 1 Assorted Old Kraft	1.75	"	—
Overissue News	.85	"	—
No. 1 News	.75	"	—
No. 1 Mixed Paper	.70	"	—
No. 1 Roofing Rags	1.55	"	—
No. 1 Roofing Bags	1.45	"	—